# DATA VALIDATION REPORT

**PROJECT:** Stormwater, Sandblast AOPC, Bradford Island, Cascade Locks, OR
**LABORATORY:** Katahdin Analytical and Eurofins TestAmerica Seattle
**MATRIX:** Stormwater
**SAMPLING DATE(S):** October 16, 2019
**SAMPLING EVENT(s):** Stormwater Sampling
**REPORT DATE:** May 1, 2020
Validator: Alison Suess

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## 1. Introduction

The following is a data validation report for stormwater samples collected on October 16, 2019 from the storm drain system in the Sandblast Area of Potential Concern (AOPC) on Bradford Island, in Cascade Locks, OR. The sample data groups (SDG), analytes measured, methods used, and the laboratory information is provided below:

| Sample Data Group (SDG) | No. of Samples | Matrix | Analyte(s) | Method | Validation Level |
|---|---|---|---|---|---|
| Katahdin TM0997 | 2 | Stormwater | Metals | 200.8 | Stage 2b (S2BVM) |
| | | | Mercury | 7470 | |
| | | | SVOCs | 8270D SIM | |
| | | | Pesticides | 8081B | |
| | | | Dissolved Organic Carbon | EPA 415.1 | |
| | | | Total Suspended Solids | SM 2540D | |
| | | | Total Hardness | 200.8 (calculated) | |
| Eurofins TestAmerica[1] 580-90149-1 | 2 | Stormwater | PCB Congeners | 1668A | Stage 2b (S2BVM) |
| | | | PAHs | 8270D SIM | |
| | | | Total Organotins | PSEP/Krone Method | |
| | | | Gas Range Organics | NWTPH-Gx | |
| | | | Diesel Range Organics | NWTPH-Dx | |

[1]Eurofins TestAmerica Seattle is a subcontractor for Katahdin.

The field sample identification numbers, sampling dates, locations, and corresponding laboratory identification numbers are listed in Table 1 (end of report).

Sample analyses were evaluated to level Stage 2B data validation. Stage 2B validation of the laboratory analytical data package consists of verification and validation based on completeness and compliance checks of sample receipt conditions and both sample-related and instrument-related QC results.

Analytical results are qualified based on the definitions and use of qualifying flags in the following resources:

- Department of Defense (DoD) Quality Systems Manual for Environmental Laboratories, Version 5.3 (DoD, 2019)
- DoD General Data Validation Guidelines (DoD, 2018a, 2018b)
- United States Environmental Protection Agency (USEPA) Guidance for Labeling Externally Validated Data for Superfund Use (USEPA, 2009)
- USEPA National Functional Guidelines (NFGs) for Superfund Data Review (USEPA, 2016, 2017a, 2017b)

Definitions for limits and flags are given in Table 2. All detected concentrations less than the Limit of Quantitation (LOQ) are reported at their detected value but flagged J for estimated. Non-detects are reported at the Limit of Detection (LOD) and flagged U for undetected.

The validated data is presented in Table 3. Some data may be qualified using the reviewer's professional judgment. The conclusions presented herein are based on the information available for the review.

## 2. Metals Data Review, ICP-MS, Method 6020A

### 2.1 Stage 1 Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Sample Custody | SATISFACTORY | All samples received under proper chain of custody.<br>• Sampled: 16 October 2019 between 1258 and 1313; held on ice overnight<br>• Relinquished at FedEx: 17 October 2019 at 0849<br>• Arrived at Katahdin: 18 October 2019 at 0935 |
| Temperature | SATISFACTORY | Temperature 4 ± 2 °C<br>• Temperature at arrival: 4.3, 1.1, 3.2 °C (3 coolers)<br>Note: Temperature of cooler is below 2 °C, but samples were not frozen, which is acceptable. |
| Holding Time | SATISFACTORY | Holding time for aqueous samples is 6 months. Samples for dissolved metals were filtered at the laboratory. Per EPA, hold time for metals to be filtered, and then acid preserved, or analyzed without acid preservation is 14 days (EPA 2016).<br>• Sampled: 16 October 2019<br>• Analyzed: 28 & 30 October 2019 (12 & 14 days) |
| Dilution | INFORMATION ONLY | No samples were diluted. |

### 2.2 Stage 2a Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Method Blank (MB) | SATISFACTORY | • Perform one per preparatory batch.<br>• The absolute values of all analytes must be < ½ LOQ or < 1/10th the amount measured in any sample or 1/10th the regulatory limit, whichever is greater. |
| Laboratory Control Sample (LCS), LCS Duplicate (LCSD), and Relative Percent Difference (RPD) | SATISFACTORY | • Perform one per preparatory batch.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits<br>• RPD of all analytes ≤ 20% (between LCS and LCSD).<br>• LCSD/RPD not necessary by Table B-9. |
| Matrix Spike (MS), Matrix Spike Duplicate (MSD), and Relative Percent Difference (RPD) | SATISFACTORY | • Perform one per preparatory batch.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits<br>• RPD of all analytes ≤ 20% (between MS and MSD).<br>• Dilution test and post digestion spike are required if MS or MSD fails. |

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Compound Identification and Quantitation | SATISFACTORY | • Compounds are identified and quantified automatically by the instrument.<br>• Manual integration of one or more chromatographic peaks may be required to correct integration performed by the instrument.<br>• All cases where manual review and integration of the chromatograms was required were initialed and dated by the reviewer in the data package.<br>• Was manual integration performed? (Y/N): N |
| Field Duplicates (FD) | NA | • RPD of all analytes ≤ 30% (between sample and FD), or as specified by project limits.<br>• Were FDs collected? (Y/N): N |
| Filter Blank | **See Qualification Summary Table** | • One filter blank is performed to perform quality control on the filtration that is performed for dissolved metals analysis.<br>• No requirements or guidelines per DoD/DOE QSM<br>• Professional judgment is used to qualify data based on detections in the filter blank. |

## 2.3 Stage 2b Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Linear Dynamic Range (LDR) or High-Level Check Standard | SATISFACTORY | • Perform at initial set-up and checked every 6 months with a high standard at the upper limit of the range.<br>• Within ± 10% of true value. |
| Tuning | SATISFACTORY | • Perform prior to ICAL.<br>• Mass calibration ≤ 0.1 amu from true value<br>• Resolution < 0.9 amu full width at 10% peak height. |
| Initial Calibration (ICAL) for All Analytes | SATISFACTORY | • Daily ICAL prior to sample analysis.<br>• If more than one calibration standard is used, $r^2 \geq$ 0.99. |
| Initial Calibration Verification (ICV) | SATISFACTORY | • Perform once after each ICAL, analysis of a second source standard prior to sample analysis.<br>• All reported analytes within ± 10% of true value. |
| Continuing Calibration Verification (CCV) | SATISFACTORY | • Perform after every 10 field samples and at the end of the analysis sequence.<br>• All reported analytes within ± 10% of the true value. |
| Low-Level Calibration Check Standard (LLCCV) | SATISFACTORY | • Perform daily.<br>• All reported analytes within ± 20% of the true value. |
| Internal Standards (IS) | SATISFACTORY | • Perform every field sample, standard and QC sample.<br>• IS intensity in the samples within 30-120% of intensity of the IS in the ICAL blank. |
| Initial and Continuing Calibration Blank (ICB/CCB) | ICB: SATISFACTORY<br>CCB: SATISFACTORY | • Perform immediately after the ICV and immediately after every CCV.<br>• The absolute values of all analytes must be < ½ LOQ or < 1/10th the amount measured in any sample. |
| Interference Check Solution (ICS) | SATISFACTORY | • Perform after ICAL and prior to sample analysis.<br>• ICS-A: Absolute value of concentration for all non-spiked project analytes <1/2 LOQ (unless they are a |

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|---|---|---|
| | | verified trace impurity from one of the spiked analytes);<br>• ICS-AB: Within ± 20% of true value. |

### 2.4 Qualification Summary Table

| SDG | Sample Affected | Analyte | Flag | Notes |
|---|---|---|---|---|
| SM5732 | OF1, OF2 | Zinc, dissolved | UJ (all detects); not flagged (non-detects) | Zinc was detected in the filter blank at 15.8 ug/L, with an LOQ of 2.0 ug/L. Dissolved zinc results are 17.1 ug/L (OF1) and 29.3 ug/L (OF2). Since concentrations in the filter blank are > 1/10 the concentration detected in the parent sample, concentrations of dissolved zinc were flagged as non-detect at their detected concentration. Total zinc sample results are not flagged. |

## 3. Mercury Data Review, AA, Method 7470A

### 3.1 Stage 1 Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Sample Custody | SATISFACTORY | All samples received under proper chain of custody.<br>• Sampled: 16 October 2019 between 1258 and 1313; held on ice overnight<br>• Relinquished at FedEx: 17 October 2019 at 0849<br>• Arrived at Katahdin: 18 October 2019 at 0935 |
| Temperature | SATISFACTORY | Temperature 4 ± 2 °C<br>• Temperature at arrival: 4.3, 1.1, 3.2 °C (3 coolers)<br>Note: Temperature of cooler is below 2 °C, but samples were not frozen, which is acceptable. |
| Holding Time | SATISFACTORY | Holding time for aqueous samples is 6 months. Samples for dissolved metals were filtered at the laboratory. Per EPA, hold time for metals to be filtered, and then acid preserved, or analyzed without acid preservation is 14 days (EPA 2016).<br>• Sampled: 16 October 2019<br>• Analyzed: 28 & 30 October 2019 (12 & 14 days) |
| Dilution | INFORMATION ONLY | No samples were diluted. |

### 3.2 Stage 2a Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Method Blank (MB) | SATISFACTORY | • Perform one per preparatory batch.<br>• The absolute values of all analytes must be < ½ LOQ or < 1/10th the amount measured in any sample or 1/10th the regulatory limit, whichever is greater. |

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Laboratory Control Sample (LCS), LCS Duplicate (LCSD), and Relative Percent Difference (RPD) | SATISFACTORY | • Perform one per preparatory batch.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits<br>• RPD of all analytes ≤ 20% (between LCS and LCSD).<br>• LCSD/RPD not necessary by Table B-9. |
| Matrix Spike (MS), Matrix Spike Duplicate (MSD), and Relative Percent Difference (RPD) | SATISFACTORY | • Perform one per preparatory batch.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits<br>• RPD of all analytes ≤ 20% (between MS and MSD).<br>• Dilution test and post digestion spike are required if MS or MSD fails. |
| Compound Identification and Quantitation | SATISFACTORY | • Compounds are identified and quantified automatically by the instrument.<br>• Manual integration of one or more chromatographic peaks may be required to correct integration performed by the instrument.<br>• All cases where manual review and integration of the chromatograms was required were initialed and dated by the reviewer in the data package.<br>• Was manual integration performed? (Y/N): N |
| Field Duplicates (FD) | NA | • RPD of all analytes ≤ 30% (between sample and FD), or as specified by project limits.<br>• Were FDs collected? (Y/N): N |
| Filter Blank | SATISFACTORY | • One filter blank is performed to perform quality control on the filtration that is performed for dissolved metals analysis.<br>• No requirements or guidelines per DoD/DOE QSM<br>• Professional judgment is used to qualify data based on detections in the filter blank.<br>• Detection of 0.020 J µg/L is < ½ LOQ of 0.20 µg/L. |

### 3.3 Stage 2b Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Initial Calibration (ICAL) for All Analytes | SATISFACTORY | • Daily ICAL prior to sample analysis.<br>• If more than one calibration standard is used, $r^2 \geq 0.99$. |
| Initial Calibration Verification (ICV) | SATISFACTORY | • Perform once after each ICAL, analysis of a second source standard prior to sample analysis.<br>• All reported analytes within ± 10% of true value. |
| Continuing Calibration Verification (CCV) | SATISFACTORY | • Perform after every 10 field samples and at the end of the analysis sequence.<br>• All reported analytes within ± 10% of the true value. |
| Low-Level Calibration Check Standard (LLCCV) | SATISFACTORY | • Perform daily.<br>• All reported analytes within ± 20% of the true value. |

| | | |
|---|---|---|
| Initial and Continuing Calibration Blank (ICB/CCB) | ICB: SATISFACTORY CCB: SATISFACTORY | • Perform immediately after the ICV and immediately after every CCV.<br>• The absolute values of all analytes must be < ½ LOQ or < 1/10th the amount measured in any sample. |

### 3.4 Qualification Summary Table

No data was qualified based on validation.

## 4. SVOCs Data Review, GC/MS, Method 8270D Selected Ion Mode (SIM)

### 4.1 Stage 1 Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Sample Custody | SATISFACTORY | All samples received under proper chain of custody.<br>• Sampled: 16 October 2019 between 1258 and 1313; held on ice overnight<br>• Relinquished at FedEx: 17 October 2019 at 0849<br>• Arrived at Katahdin: 18 October 2019 at 0935 |
| Temperature | SATISFACTORY | Temperature 4 ± 2 °C<br>Temperature at arrival: 4.3, 1.1, 3.2 °C (3 coolers)<br>Note: Temperature of cooler is below 2 °C, but samples were not frozen, which is acceptable. |
| Holding Time | SATISFACTORY | Holding time for aqueous samples is 14 days, and and analysis holding time for extracts is 40 days.<br>• Sampled: 16 October 2019<br>• Extracted 21 October 2019 (5 days)<br>• Analyzed: 26 November 2019 (36 days) |
| Dilution | INFORMATION ONLY | No samples were diluted. |

### 4.2 Stage 2a Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Method Blank (MB) | SATISFACTORY | • Perform one per preparatory batch.<br>• No analytes detected > ½ LOQ or > 1/10th the amount measured in any sample or 1/10th the regulatory limit, whichever is greater.<br>• Common contaminants must not be detected > LOQ. |
| Laboratory Control Sample (LCS) | **See Qualification Summary Table** | • Perform one per preparatory batch.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits |
| Matrix Spike (MS), Matrix Spike Duplicate (MSD), and Relative Percent Difference (RPD) | **See Qualification Summary Table** | • Perform one per preparatory batch.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits<br>• RPD of all analytes ≤ 20% (between MS and MSD). |
| Surrogate Spike | SATISFACTORY | • Perform for all field and QC samples.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan. |

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Compound Identification and Quantitation | SATISFACTORY | • Compounds are identified and quantified automatically by the instrument.<br>• Manual integration of one or more chromatographic peaks may be required to correct integration performed by the instrument.<br>• All cases where manual review and integration of the chromatograms was required were initialed and dated by the reviewer in the data package.<br>• Was manual integration performed? (Y/N): Y |
| Field Duplicates (FD) | NA | • RPD of all analytes ≤ 30% (between sample and FD), or as specified by project limits.<br>• Were FDs collected? (Y/N): N |

### 4.3 Stage 2b Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Tune Check | SATISFACTORY | • Perform prior to ICAL and prior to each 12-hour period of sample analysis.<br>• Mass Specific ion abundance criteria of BFB or DFTPP from method. |
| Performance Check (Method 8270 only) | SATISFACTORY | • Perform at the beginning of each 12-hour period, prior to analysis of samples.<br>• Degradation ≤ 20% for DDT.<br>• Benzidine and pentachlorophenol shall be present at their normal responses and shall not exceed a tailing factor of 2. |
| Initial Calibration (ICAL) for All Analytes Including Surrogates | SATISFACTORY | • Perform at instrument set-up and after ICV or CCV failure, prior to sample analysis.<br>• Each analyte must meet one of the three options below:<br>Option 1: RSD for each analyte ≤ 15%;<br>Option 2: linear least squares regression for each analyte: r2 ≥ 0.99;<br>Option 3: non-linear least squares regression (quadratic) for each analyte: r2 ≥ 0.99. |
| Retention Time window position establishment | SATISFACTORY | • Perform once per ICAL and at the beginning of the analytical sequence.<br>• Position shall be set using the midpoint standard of the ICAL curve when ICAL is performed.<br>• On days when ICAL is not performed, the initial CCV is used. |
| Evaluation of Relative Retention Times (RRT) | SATISFACTORY | • Perform with each sample.<br>• RRT of each reported analyte within ± 0.06 RRT units. |
| Initial Calibration Verification (ICV) | SATISFACTORY | • Perform once after each ICAL, analysis of a second source standard prior to sample analysis.<br>• All reported analytes within ± 20% of true value. |

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Continuing Calibration Verification (CCV) | **See Qualification Summary Table** | • Perform daily before sample analysis; after every 12 hours of analysis time; and at the end of the analytical batch run.<br>• All reported analytes and surrogates within ± 20% of the true value.<br>• All reported analytes and surrogates within ± 50% for end of analytical batch CCV. |
| Internal Standards (IS) | SATISFACTORY | • Perform every field sample, standard and QC sample.<br>• Retention time within ± 10 seconds from retention time of the midpoint standard in the ICAL; EICP area within – 50% to +100% of ICAL midpoint standard.<br>• On days when ICAL is not performed, the daily initial CCV can be used. |

### 4.4 Qualification Summary Table

| SDG | Sample Affected | Analyte | Flag | Notes |
|---|---|---|---|---|
| TM0997 | OF1, OF2 | Bis(2-ethylhexyl)Phthalate | J- (all detects); UJ (all non-detects) | LCS %R is out of control low. |
| TM0997 | OF2 | Bis(2-ethylhexyl)Phthalate | J- (all detects); UJ (all non-detects) | The MS and MSD low recovery and RPD was out of control limits. |
| TM0997 | OF2 | All analytes | None | Two closing CVs ( N6189 and N6259) were acceptable but were analyzed 24 minutes outside of the 12 hour window. If the closing CV fails, the DoD QSM allows for analysis of two additional CVs outside of the 12-hour window. Two additional CVs each were analyzed (N6109 and N6191; N6260 and N6261; respectively) were analyzed and all were reported. |

## 5. PAHs Data Review, GC/MS, Method 8270D Selected Ion Mode (SIM)

### 5.1 Stage 1 Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Sample Custody | SATISFACTORY | All samples received under proper chain of custody.<br>• Sampled: 16 October 2019 between 1258 and 1313; held on ice overnight<br>• Relinquished at FedEx: 17 October 2019 at 0849<br>• Arrived at Katahdin: 18 October 2019 at 0935 |
| Temperature | SATISFACTORY | Temperature 4 ± 2 °C<br>Temperature at arrival: 4.3, 1.1, 3.2 °C (3 coolers)<br>Note: Temperature of cooler is below 2 °C, but samples were not frozen, which is acceptable. |
| Holding Time | SATISFACTORY | Extraction holding time for aqueous samples is 14 days, and analysis holding time for extracts is 40 days.<br>• Sampled: 16 October 2019<br>• Extracted: 23 October 2019 (7 days)<br>• Analyzed: 25 October 2019 (2 days) |

| | | |
|---|---|---|
| Dilution | INFORMATION ONLY | No samples were diluted. |

## 5.2 Stage 2a Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Method Blank (MB) | SATISFACTORY | • Perform one per preparatory batch.<br>• No analytes detected > ½ LOQ or > 1/10th the amount measured in any sample or 1/10th the regulatory limit, whichever is greater.<br>• Common contaminants must not be detected > LOQ. |
| Laboratory Control Sample (LCS) | SATISFACTORY | • Perform one per preparatory batch.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits |
| Matrix Spike (MS), Matrix Spike Duplicate (MSD), and Relative Percent Difference (RPD) | **See Qualification Summary Table** | • Perform one per preparatory batch.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits<br>• RPD of all analytes ≤ 20% (between MS and MSD). |
| Surrogate Spike | **See Qualification Summary Table** | • Perform for all field and QC samples.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan. |
| Compound Identification and Quantitation | SATISFACTORY | • Compounds are identified and quantified automatically by the instrument.<br>• Manual integration of one or more chromatographic peaks may be required to correct integration performed by the instrument.<br>• All cases where manual review and integration of the chromatograms was required were initialed and dated by the reviewer in the data package.<br>• Was manual integration performed? (Y/N): Y |
| Field Duplicates (FD) | NA | • RPD of all analytes ≤ 30% (between sample and FD), or as specified by project limits.<br>• Were FDs collected? (Y/N): N |

## 5.3 Stage 2b Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Tune Check | SATISFACTORY | • Perform prior to ICAL and prior to each 12-hour period of sample analysis.<br>• Mass Specific ion abundance criteria of BFB or DFTPP from method. |
| Performance Check (Method 8270 only) | SATISFACTORY | • Perform at the beginning of each 12-hour period, prior to analysis of samples.<br>• Degradation ≤ 20% for DDT.<br>• Benzidine and pentachlorophenol shall be present at their normal responses and shall not exceed a tailing factor of 2. |

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Initial Calibration (ICAL) for All Analytes Including Surrogates | SATISFACTORY | • Perform at instrument set-up and after ICV or CCV failure, prior to sample analysis.<br>• Each analyte must meet one of the three options below:<br>Option 1: RSD for each analyte ≤ 15%;<br>Option 2: linear least squares regression for each analyte: r2 ≥ 0.99;<br>Option 3: non-linear least squares regression (quadratic) for each analyte: r2 ≥ 0.99. |
| Retention Time window position establishment | SATISFACTORY | • Perform once per ICAL and at the beginning of the analytical sequence.<br>• Position shall be set using the midpoint standard of the ICAL curve when ICAL is performed.<br>• On days when ICAL is not performed, the initial CCV is used. |
| Evaluation of Relative Retention Times (RRT) | SATISFACTORY | • Perform with each sample.<br>• RRT of each reported analyte within ± 0.06 RRT units. |
| Initial Calibration Verification (ICV) | SATISFACTORY | • Perform once after each ICAL, analysis of a second source standard prior to sample analysis.<br>• All reported analytes within ± 20% of true value. |
| Continuing Calibration Verification (CCV) | SATISFACTORY | • Perform daily before sample analysis; after every 12 hours of analysis time; and at the end of the analytical batch run.<br>• All reported analytes and surrogates within ± 20% of the true value.<br>• All reported analytes and surrogates within ± 50% for end of analytical batch CCV. |
| Internal Standards (IS) | SATISFACTORY | • Perform every field sample, standard and QC sample.<br>• Retention time within ± 10 seconds from retention time of the midpoint standard in the ICAL; EICP area within – 50% to +100% of ICAL midpoint standard.<br>• On days when ICAL is not performed, the daily initial CCV can be used. |

## 5.4 Qualification Summary Table

| SDG | Sample Affected | Analyte | Flag | Notes |
|---|---|---|---|---|
| 580-90149-1 | OF2 | Naphthalene,<br>Acenaphthene,<br>Fluorene,<br>Phenanthrene | J- (all detects)<br>UJ (all non-detects) | MS %R out of control limits low. |
| | OF2 | Naphthalene,<br>Acenaphthylene,<br>Acenaphthene,<br>Fluorene,<br>Phenanthrene,<br>Anthracene,<br>Benzo[b]fluoranthene | J- (all detects)<br>UJ (all non-detects) | MSD %R out of control limits low. |

| SDG | Sample Affected | Analyte | Flag | Notes |
|---|---|---|---|---|
| | OF2 | Naphthalene, Benzo[b]fluoranthene | J- (all detects)<br>UJ (all non-detects) | MS/MSD RPD out of control limits. Flagged J- because MS and/or MSD %R were out of control limits low. |
| | OF1 | All analytes | J- (all detects)<br>UJ (all non-detects | %R of one of the three surrogates, terphenyl-d14, was out of control limits low. |

## 6. Organochlorine Pesticides Data Review, GC/MS, Method 8081B

### 6.1 Stage 1 Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Sample Custody | SATISFACTORY | All samples received under proper chain of custody.<br>• Sampled: 16 October 2019 between 1258 and 1313; held on ice overnight<br>• Relinquished at FedEx: 17 October 2019 at 0849<br>• Arrived at Eurofins TestAmerica: 18 October 2019 at 0915 |
| Temperature | SATISFACTORY | Temperature 4 ± 2 °C<br>Temperature at arrival: 1.1, 3.6 and 3.6 °C (3 coolers)<br>Note: Temperature of cooler is below 2 °C, but samples were not frozen, which is acceptable. |
| Holding Time | SATISFACTORY | Extraction holding time for solid samples is 14 days, and analysis holding time for extracts is 40 days.<br>• Sampled: 16 October 2019<br>• Extracted: 22 October 2019 (6 days)<br>• Analyzed: 25 October 2019 (3 days) |
| Dilution | INFORMATION ONLY | No samples were diluted. |

### 6.2 Stage 2a Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Method Blank (MB) | SATISFACTORY | • Perform one per preparatory batch.<br>• No analytes detected > ½ LOQ or > 1/10th the amount measured in any sample or 1/10th the regulatory limit, whichever is greater.<br>• Common contaminants must not be detected > LOQ. |
| Laboratory Control Sample (LCS) | SATISFACTORY | • Perform one per preparatory batch.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits |
| Matrix Spike (MS), Matrix Spike Duplicate (MSD), and Relative Percent Difference (RPD) | SATISFACTORY | • Perform one per preparatory batch.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits<br>• RPD of all analytes ≤ 20% (between MS and MSD). |

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Surrogate Spike | SATISFACTORY | • Perform for all field and QC samples.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan. |
| Compound Identification and Quantitation | SATISFACTORY | • Compounds are identified and quantified automatically by the instrument.<br>• Manual integration of one or more chromatographic peaks may be required to correct integration performed by the instrument.<br>• All cases where manual review and integration of the chromatograms was required were initialed and dated by the reviewer in the data package.<br>• Was manual integration performed? (Y/N): Y |
| Field Duplicates (FD) | NA | • RPD of all analytes ≤ 30% (between sample and FD), or as specified by project limits.<br>• Were FDs collected? (Y/N): N |
| Confirmation by Dual Column Analysis | **See Qualification Summary Table** | • RPD is within method acceptance limits (40%) |

### 6.3 Stage 2b Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Tune Check | SATISFACTORY | • Perform prior to ICAL and prior to each 12-hour period of sample analysis.<br>• Mass Specific ion abundance criteria of BFB or DFTPP from method. |
| Initial Calibration (ICAL) for All Analytes Including Surrogates | SATISFACTORY | • Perform at instrument set-up and after ICV or CCV failure, prior to sample analysis.<br>• Each analyte must meet one of the three options below:<br>Option 1: RSD for each analyte ≤ 15%;<br>Option 2: linear least squares regression for each analyte: r2 ≥ 0.99;<br>Option 3: non-linear least squares regression (quadratic) for each analyte: r2 ≥ 0.99. |
| Retention Time window position establishment | SATISFACTORY | • Perform once per ICAL and at the beginning of the analytical sequence.<br>• Position shall be set using the midpoint standard of the ICAL curve when ICAL is performed.<br>• On days when ICAL is not performed, the initial CCV is used. |
| Evaluation of Relative Retention Times (RRT) | SATISFACTORY | • Perform with each sample.<br>• RRT of each reported analyte within ± 0.06 RRT units. |
| Initial Calibration Verification (ICV) | SATISFACTORY | • Perform once after each ICAL, analysis of a second source standard prior to sample analysis.<br>• All reported analytes within ± 20% of true value. |

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Continuing Calibration Verification (CCV) | **See Qualification Summary Table** | • Perform daily before sample analysis; after every 12 hours of analysis time; and at the end of the analytical batch run.<br>• All reported analytes and surrogates within ± 20% of the true value.<br>• All reported analytes and surrogates within ± 50% for end of analytical batch CCV. |
| Internal Standards (IS) | SATISFACTORY | • Perform every field sample, standard and QC sample.<br>• Retention time within ± 10 seconds from retention time of the midpoint standard in the ICAL; EICP area within – 50% to +100% of ICAL midpoint standard.<br>• On days when ICAL is not performed, the daily initial CCV can be used. |

### 6.4 Qualification Summary Table

| SDG | Sample Affected | Analyte | Flag | Notes |
|---|---|---|---|---|
| TM0997 | OF1 | Endrin Ketone | J (all detects)<br>UJ (all non-detects) | Dual column RPD for endrin ketone outside of the method acceptance limit of 40%. |
| | OF2 | Oxychlordane | J (all detects)<br>UJ (all non-detects) | Dual column RPD for oxychlordane outside of the method acceptance limit of 40%. |
| | OF1, OF2 | 4,4'-DDT | None | The CCV standard (IMJ10305) had a low response on channel A for the target analyte 4,4'-DDT that resulted in a %D that was outside of the DoD QSM acceptance criteria of +/-20%. Since the response was acceptable on channel B, no further action was taken. |

## 7. Polychlorinated Biphenyl (PCB) Congeners Data Review, GC/MS, Method 1668C

### 7.1 Stage 1 Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Sample Custody | SATISFACTORY | All samples received under proper chain of custody.<br>• Sampled: 16 October 2019 between 1258 and 1313; held on ice overnight<br>• Relinquished at FedEx: 17 October 2019 at 0849<br>• Arrived at Eurofins TestAmerica: 18 October 2019 at 0915 |
| Temperature | SATISFACTORY | Temperature 4 ± 2 °C<br>Temperature at arrival: 1.1, 3.6 and 3.6 °C (3 coolers)<br>Note: Temperature of cooler is below 2 °C, but samples were not frozen, which is acceptable. |
| Holding Time | SATISFACTORY | Extraction holding time for solid samples is 14 days, and analysis holding time for extracts is 40 days.<br>• Sampled: 16 October 2019<br>• Extracted: 25 October 2019 (9 days)<br>• Analyzed: 4 November 2019 (9 days) |
| Dilution | INFORMATION ONLY | No samples were diluted. |

## 7.2 Stage 2a Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Method Blank (MB) | **See Qualification Summary Table** | • Perform one per preparatory batch.<br>• No analytes detected > ½ LOQ or > 1/10th the amount measured in any sample or 1/10th the regulatory limit, whichever is greater.<br>• Common contaminants must not be detected > LOQ. |
| Laboratory Control Sample (LCS) | SATISFACTORY | • Perform one per preparatory batch.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits |
| Matrix Spike (MS), Matrix Spike Duplicate (MSD), and Relative Percent Difference (RPD) | SATISFACTORY | • Perform one per preparatory batch.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits<br>• RPD of all analytes ≤ 50% (between MS and MSD). |
| Surrogate Spike | SATISFACTORY | • Perform for all field and QC samples.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan. |
| Compound Identification and Quantitation | SATISFACTORY | • Compounds are identified and quantified automatically by the instrument.<br>• Manual integration of one or more chromatographic peaks may be required to correct integration performed by the instrument.<br>• All cases where manual review and integration of the chromatograms was required were initialed and dated by the reviewer in the data package.<br>• Was manual integration performed? (Y/N): Y |
| Field Duplicates (FD) | NA | • RPD of all analytes ≤ 30% (between sample and FD), or as specified by project limits.<br>• Were FDs collected? (Y/N): N |

## 7.3 Stage 2b Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Tune Check | SATISFACTORY | • Perform prior to ICAL and prior to each 12-hour period of sample analysis.<br>• Mass Specific ion abundance criteria of BFB or DFTPP from method. |
| Initial Calibration (ICAL) for All Analytes Including Surrogates | SATISFACTORY | • Perform at instrument set-up and after ICV or CCV failure, prior to sample analysis.<br>• Each analyte must meet one of the three options below:<br>Option 1: RSD for each analyte ≤ 15%;<br>Option 2: linear least squares regression for each analyte: r2 ≥ 0.99;<br>Option 3: non-linear least squares regression (quadratic) for each analyte: r2 ≥ 0.99. |

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Retention Time window position establishment | SATISFACTORY | • Perform once per ICAL and at the beginning of the analytical sequence.<br>• Position shall be set using the midpoint standard of the ICAL curve when ICAL is performed.<br>• On days when ICAL is not performed, the initial CCV is used. |
| Evaluation of Relative Retention Times (RRT) | SATISFACTORY | • Perform with each sample.<br>• RRT of each reported analyte within ± 0.06 RRT units. |
| Initial Calibration Verification (ICV) | SATISFACTORY | • Perform once after each ICAL, analysis of a second source standard prior to sample analysis.<br>• All reported analytes within ± 20% of true value. |
| Continuing Calibration Verification (CCV) | SATISFACTORY | • Perform daily before sample analysis; after every 12 hours of analysis time; and at the end of the analytical batch run.<br>• All reported analytes and surrogates within ± 20% of the true value.<br>• All reported analytes and surrogates within ± 50% for end of analytical batch CCV. |
| Internal Standards (IS) | SATISFACTORY | • Perform every field sample, standard and QC sample.<br>• Retention time within ± 10 seconds from retention time of the midpoint standard in the ICAL; EICP area within – 50% to +100% of ICAL midpoint standard.<br>• On days when ICAL is not performed, the daily initial CCV can be used. |

### 7.4 Qualification Summary Table

| SDG | Sample Affected | Analyte | Flag | Notes |
|---|---|---|---|---|
| 580-90149-1 | OF1 | PCB-44<br>PCB-47 | UJ (all detects) | Concentrations detected in the method blank are > 1/10 the concentration detected in the parent sample. Concentrations were flagged as non-detect at their detected concentration. |
| | | PCB-52<br>PCB-65<br>PCB-129<br>PCB-138<br>PCB-163<br>PCB-183 | No flag | Concentrations detected in the method blank are < 1/10 the concentration detected in the parent sample. |
| | OF2 | PCB-44<br>PCB-47<br>PCB-52<br>PCB-65 | UJ (all detects) | Concentrations detected in the method blank are > 1/10 the concentration detected in the parent sample. Concentrations were flagged as non-detect at their detected concentration. |
| | | PCB-129<br>PCB-138<br>PCB-163<br>PCB-183 | No flag | Concentrations detected in the method blank are < 1/10 the concentration detected in the parent sample. |

## 8. Organotins Data Review, GC/MS, PSEP/Krone Method

### 8.1 Stage 1 Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Sample Custody | SATISFACTORY | All samples received under proper chain of custody.<br>• Sampled: 16 October 2019 between 1258 and 1313; held on ice overnight<br>• Relinquished at FedEx: 17 October 2019 at 0849<br>• Arrived at Eurofins TestAmerica: 18 October 2019 at 0915 |
| Temperature | SATISFACTORY | Temperature 4 ± 2 °C<br>Temperature at arrival: 1.1, 3.6 and 3.6 °C (3 coolers)<br>Note: Temperature of cooler is below 2 °C, but samples were not frozen, which is acceptable. |
| Holding Time | **See Qualification Summary Table** | Extraction holding time for solid samples is 14 days, and analysis holding time for extracts is 40 days.<br>Total Organotins:<br>• Sampled: 16 October 2019<br>• Prepared: 31 October 2019 (15 days)<br>o Out of limits<br>• Analyzed: 1 November 2019 (10 days)<br>Dissolved Organotins:<br>• Sampled: 16 October 2019<br>• Prepared: 22 October 2019 (6 days)<br>• Analyzed: 5 November 2019 (10 days) |
| Dilution | INFORMATION ONLY | No samples were diluted. |

### 8.2 Stage 2a Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Method Blank (MB) | SATISFACTORY | • Perform one per preparatory batch.<br>• No analytes detected > ½ LOQ or > 1/10th the amount measured in any sample or 1/10th the regulatory limit, whichever is greater.<br>• Common contaminants must not be detected > LOQ. |
| Laboratory Control Sample (LCS), Laboratory Control Sample Duplicate (LCSD) and Relative Percent Difference (RPD) | **See Qualification Summary Table** | • Perform one per preparatory batch.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits for recovery and RPD. |
| Matrix Spike (MS), Matrix Spike Duplicate (MSD), and Relative Percent Difference (RPD) | **See Qualification Summary Table** | • Perform one per preparatory batch.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits for recovery and RPD. |
| Surrogate Spike | SATISFACTORY | • Perform for all field and QC samples.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan. |

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Compound Identification and Quantitation | SATISFACTORY | • Compounds are identified and quantified automatically by the instrument.<br>• Manual integration of one or more chromatographic peaks may be required to correct integration performed by the instrument.<br>• All cases where manual review and integration of the chromatograms was required were initialed and dated by the reviewer in the data package.<br>• Was manual integration performed? (Y/N): Y |
| Field Duplicates (FD) | NA | • RPD of all analytes ≤ 30% (between sample and FD), or as specified by project limits.<br>• Were FDs collected? (Y/N): N |

### 8.3 Stage 2b Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Tune Check | SATISFACTORY | • Perform prior to ICAL and prior to each 12-hour period of sample analysis.<br>• Mass Specific ion abundance criteria of BFB or DFTPP from method. |
| Initial Calibration (ICAL) for All Analytes Including Surrogates | SATISFACTORY | • Perform at instrument set-up and after ICV or CCV failure, prior to sample analysis.<br>• Each analyte must meet one of the three options below:<br>Option 1: RSD for each analyte ≤ 15%;<br>Option 2: linear least squares regression for each analyte: r2 ≥ 0.99;<br>Option 3: non-linear least squares regression (quadratic) for each analyte: r2 ≥ 0.99. |
| Retention Time window position establishment | SATISFACTORY | • Perform once per ICAL and at the beginning of the analytical sequence.<br>• Position shall be set using the midpoint standard of the ICAL curve when ICAL is performed.<br>• On days when ICAL is not performed, the initial CCV is used. |
| Evaluation of Relative Retention Times (RRT) | SATISFACTORY | • Perform with each sample.<br>• RRT of each reported analyte within ± 0.06 RRT units. |
| Initial Calibration Verification (ICV) | SATISFACTORY | • Perform once after each ICAL, analysis of a second source standard prior to sample analysis.<br>• All reported analytes within ± 20% of true value.<br>• In-house laboratory limit of ± 25% of true value was used. |
| Continuing Calibration Verification (CCV) | SATISFACTORY | • Perform daily before sample analysis; after every 12 hours of analysis time; and at the end of the analytical batch run.<br>• All reported analytes and surrogates within ± 20% of the true value.<br>• All reported analytes and surrogates within ± 50% for end of analytical batch CCV. |

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Internal Standards (IS) | SATISFACTORY | • Perform every field sample, standard and QC sample.<br>• Retention time within ± 10 seconds from retention time of the midpoint standard in the ICAL; EICP area within – 50% to +100% of ICAL midpoint standard.<br>• On days when ICAL is not performed, the daily initial CCV can be used. |

### 8.4 Qualification Summary Table

| SDG | Sample Affected | Analyte | Flag | Notes |
|---|---|---|---|---|
| 580-90149-1 | Total Organotins: OF 1, 2 | All analytes | J (all detects), UJ (all non-detects) | Extraction was performed one day out of the holding time range. |
| | Total Organotins: OF 1, 2 | Monobutyltin | J- (all detects), UJ (all non-detects) | The LCS/LCSD RPD was out of control limits. The LCS and LCS %R were within control limits, although the LCS %R was near the low end of the control range. |
| | Total Organotins: OF 2 | Monobutyltin | J- (all detects)<br>UJ (all non-detects) | MS and MSD %R out of control limits low. |
| | Dissolved Organotins: OF 2 | Monobutyltin | J- (all detects)<br>UJ (all non-detects) | MS and MSD %R out of control limits low. |

## 9. Gas-Range Petroleum Products Data Review, GC, Method NWTPH-Gx

### 9.1 Stage 1 Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Sample Custody | SATISFACTORY | All samples received under proper chain of custody.<br>• Sampled: 16 October 2019 between 1258 and 1313; held on ice overnight<br>• Relinquished at FedEx: 17 October 2019 at 0849<br>• Arrived at Eurofins TestAmerica: 18 October 2019 at 0915 |
| Temperature | SATISFACTORY | Temperature 4 ± 2 °C<br>Temperature at arrival: 1.1, 3.6 and 3.6 °C (3 coolers)<br>Note: Temperature of cooler is below 2 °C, but samples were not frozen, which is acceptable. |
| Holding Time | SATISFACTORY | Holding time for aqueous samples is 14 days.<br>• Sampled: 16 October 2019<br>• Analyzed: 22 October 2019 (6 days) |
| Dilution | INFORMATION ONLY | No samples were diluted. |
| Headspace | **See Qualification Summary Table** | Requirement: No significant headspace. |

## 9.2 Stage 2a Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Method Blank (MB) | SATISFACTORY | • Perform one per preparatory batch.<br>• No analytes detected > ½ LOQ or > 1/10th the amount measured in any sample or 1/10th the regulatory limit, whichever is greater.<br>• Common contaminants must not be detected > LOQ. |
| Laboratory Control Sample (LCS) | SATISFACTORY | • Perform one per preparatory batch.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits |
| Matrix Spike (MS), Matrix Spike Duplicate (MSD), and Relative Percent Difference (RPD) | SATISFACTORY | • Perform one per preparatory batch.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits<br>• RPD of all analytes ≤ 30% (between MS and MSD). |
| Surrogate Spike | SATISFACTORY | • Perform for all field and QC samples.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan. |
| Compound Identification and Quantitation | SATISFACTORY | • Compounds are identified and quantified automatically by the instrument.<br>• Manual integration of one or more chromatographic peaks may be required to correct integration performed by the instrument.<br>• All cases where manual review and integration of the chromatograms was required were initialed and dated by the reviewer in the data package.<br>• Was manual integration performed? (Y/N): N |
| Field Duplicates (FD) | NA | • RPD of all analytes ≤ 30% (between sample and FD), or as specified by project limits.<br>• Were FDs collected? (Y/N): N |

## 9.3 Stage 2b Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Initial Calibration (ICAL) for All Analytes Including Surrogates | SATISFACTORY | • Perform at instrument set-up and after ICV or CCV failure, prior to sample analysis.<br>• Each analyte must meet one of the three options below:<br>Option 1: RSD for each analyte ≤ 20%;<br>Option 2: linear least squares regression for each analyte: r2 ≥ 0.99;<br>Option 3: non-linear least squares regression (quadratic) for each analyte: r2 ≥ 0.99. |
| Retention Time window position establishment | SATISFACTORY | • Perform once per ICAL and at the beginning of the analytical sequence.<br>• Position shall be set using the midpoint standard of the ICAL curve when ICAL is performed.<br>• On days when ICAL is not performed, the initial CCV is used. |

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Retention Time (RT) Window Width | SATISFACTORY | • Perform at method set-up and after major maintenance (e.g., column change).<br>• RT width is ± 3 times standard deviation for each analyte RT from the 72-hour study or 0.03 minutes, whichever is greater. |
| Initial Calibration Verification (ICV) | SATISFACTORY | • Perform once after each ICAL, analysis of a second source standard prior to sample analysis.<br>• All reported analytes within established RT windows.<br>• All reported analytes within ± 20% of true value. |
| Continuing Calibration Verification (CCV) | SATISFACTORY | • Perform daily before sample analysis, after every 10 field samples, and at the end of the analysis sequence with the exception of CCVs for Pesticide multi-component analytes (i.e., Toxaphene, Chlordane and Aroclors other than 1016 and 1260), which are only required before sample analysis.<br>• All reported analytes and surrogates within established RT windows.<br>• All reported analytes and surrogates within ± 20% of true value. |

### 9.4 Qualification Summary Table

| SDG | Sample Affected | Analyte | Flag | Notes |
|---|---|---|---|---|
| 580-90149-1 | OF 1, 2 | All analytes | J- (all detects)<br>UJ (all non-detects) | All samples had significant headspace, defined as a bubble greater than 6 mm in diameter. |

## 10. Diesel-Range Petroleum Products Data Review, GC, Method NWTPH-Gx

### 10.1 Stage 1 Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Sample Custody | SATISFACTORY | All samples received under proper chain of custody.<br>• Sampled: 16 October 2019 between 1258 and 1313; held on ice overnight<br>• Relinquished at FedEx: 17 October 2019 at 0849<br>• Arrived at Eurofins TestAmerica: 18 October 2019 at 0915 |
| Temperature | SATISFACTORY | Temperature 4 ± 2 °C<br>Temperature at arrival: 1.1, 3.6 and 3.6 °C (3 coolers)<br>Note: Temperature of cooler is below 2 °C, but samples were not frozen, which is acceptable. |
| Holding Time | SATISFACTORY | Holding time for aqueous samples is 14 days.<br>• Sampled: 16 October 2019<br>• Extracted: 30 October 2019 (14 days)<br>• Analyzed: 8 November 2019 (9 days)<br>Rextraction:<br>• Extracted: 8 November 2019 (23 days)<br>o Out of limits<br>• Analyzed: 10 November 2019 (2 days) |
| Dilution | INFORMATION ONLY | No samples were diluted. |

## 10.2 Stage 2a Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Method Blank (MB) | **See Qualification Summary Table** | • Perform one per preparatory batch.<br>• No analytes detected > ½ LOQ or > 1/10th the amount measured in any sample or 1/10th the regulatory limit, whichever is greater.<br>• Common contaminants must not be detected > LOQ. |
| Laboratory Control Sample (LCS) | SATISFACTORY | • Perform one per preparatory batch.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits |
| Matrix Spike (MS), Matrix Spike Duplicate (MSD), and Relative Percent Difference (RPD) | SATISFACTORY | • Perform one per preparatory batch.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits<br>• RPD of all analytes ≤ 30% (between MS and MSD). |
| Surrogate Spike | See Qualification Summary Table | • Perform for all field and QC samples.<br>• Recoveries must be within DoD/DOE QSM Appendix C Limits, project limits, or lab in-house limits as specified in the project plan. |
| Compound Identification and Quantitation | SATISFACTORY | • Compounds are identified and quantified automatically by the instrument.<br>• Manual integration of one or more chromatographic peaks may be required to correct integration performed by the instrument.<br>• All cases where manual review and integration of the chromatograms was required were initialed and dated by the reviewer in the data package.<br>• Was manual integration performed? (Y/N): N |
| Field Duplicates (FD) | NA | • RPD of all analytes ≤ 30% (between sample and FD), or as specified by project limits.<br>• Were FDs collected? (Y/N): N |

## 10.3 Stage 2b Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Initial Calibration (ICAL) for All Analytes Including Surrogates | SATISFACTORY | • Perform at instrument set-up and after ICV or CCV failure, prior to sample analysis.<br>• Each analyte must meet one of the three options below:<br>Option 1: RSD for each analyte ≤ 20%;<br>Option 2: linear least squares regression for each analyte: r2 ≥ 0.99;<br>Option 3: non-linear least squares regression (quadratic) for each analyte: r2 ≥ 0.99. |

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Retention Time window position establishment | SATISFACTORY | • Perform once per ICAL and at the beginning of the analytical sequence.<br>• Position shall be set using the midpoint standard of the ICAL curve when ICAL is performed.<br>• On days when ICAL is not performed, the initial CCV is used. |
| Retention Time (RT) Window Width | SATISFACTORY | • Perform at method set-up and after major maintenance (e.g., column change).<br>• RT width is ± 3 times standard deviation for each analyte RT from the 72-hour study or 0.03 minutes, whichever is greater. |
| Initial Calibration Verification (ICV) | SATISFACTORY | • Perform once after each ICAL, analysis of a second source standard prior to sample analysis.<br>• All reported analytes within established RT windows.<br>• All reported analytes within ± 20% of true value. |
| Continuing Calibration Verification (CCV) | SATISFACTORY | • Perform daily before sample analysis, after every 10 field samples, and at the end of the analysis sequence with the exception of CCVs for Pesticide multi-component analytes (i.e., Toxaphene, Chlordane and Aroclors other than 1016 and 1260), which are only required before sample analysis.<br>• All reported analytes and surrogates within established RT windows.<br>• All reported analytes and surrogates within ± 20% of true value. |

## 10.4 Qualification Summary Table

| SDG | Sample Affected | Analyte | Flag | Notes |
|---|---|---|---|---|
| 580-90149-1 | OF 2 | #2 Diesel (C10-C24) | J+ (all detects); no flag (all non-detects) | The o-terphenyl surrogate %R was greater than control limits. |
| 580-90149-1 | OF 1, 2 | All analytes | No flags | The method blank recovered outside control limits, low-biased, for the o-terphenyl surrogate. Samples associated with this method blank were re-extracted outside of holding time with concurrent results. Both sets of data were reported, and the first set (within holding time) is recommended for use by this data validation report. |

## 11. Dissolved Organic Carbon, Method EPA 415.1

### 11.1 Stage 1 Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Sample Custody | SATISFACTORY | All samples received under proper chain of custody.<br>• Sampled: 16 October 2019 between 1258 and 1313; held on ice overnight<br>• Relinquished at FedEx: 17 October 2019 at 0849<br>• Arrived at Katahdin: 18 October 2019 at 0935 |
| Temperature | SATISFACTORY | Temperature 4 ± 2 °C<br>• Temperature at arrival: 4.3, 1.1, 3.2 °C (3 coolers)<br>Note: Temperature of cooler is below 2 °C, but samples were not frozen, which is acceptable. |
| Holding Time | SATISFACTORY | Holding time for aqueous samples is 28 days.<br>• Sampled: 16 October 2019<br>• Analyzed: 25 October 2019 (9 days) |
| Dilution | INFORMATION ONLY | No samples were diluted. |

### 11.2 Stage 2a Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Method Blank (MB) | SATISFACTORY | • Perform one per preparatory batch.<br>• No analytes detected > ½ LOQ or > 1/10th the amount measured in any sample or 1/10th the regulatory limit, whichever is greater. |
| Laboratory Control Sample (LCS) | SATISFACTORY | • Perform one per preparatory batch.<br>• Recoveries must be within project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits |
| Field Duplicates (FD) | NA | • RPD of all analytes ≤ 30% (between sample and FD), or as specified by project limits.<br>• Were FDs collected? (Y/N): N |

### 11.3 Stage 2b Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Initial Calibration (ICAL) for All Analytes Including Surrogates | SATISFACTORY | • Perform prior to sample analysis.<br>• Blank plus 5 points.<br>• r2 ≥ 0.995. |
| Initial Calibration Verification (ICV) | SATISFACTORY | • Perform daily, prior to sample analysis, immediately following ICAL.<br>• Within ± 10% of expected concentration. |
| Carbonate-bicarbonate ($CO_3$-$HCO_3$) Standard | SATISFACTORY | • For instruments which subtract the inorganic concentration from the total to calculate the TOC, ± 10% from expected concentration.<br>• For instruments which acidify and sparge the inorganic carbon, a recovery of less than the contract-required detection limit (CRDL) is required. |
| Continuing Calibration Verification (CCV) | SATISFACTORY | • Perform before sample analysis, after every 10 samples and end of run.<br>• Within ± 10% of expected concentration. |

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Calibration Blank Verification (ICB, CCB) | SATISFACTORY | • Perform after ICV and CCVs<br>• < CRDL |
| Contract-Required Detection Limit (CRDL) Verification Standard ( < 2X CRDL)<br>or<br>LCS | SATISFACTORY | • After initial CCV<br>• Within ± 20% of expected concentration. |

### 11.4 Qualification Summary Table

No data was qualified based on validation.

## 12. Total Suspended Solids, Method SM 2540D

### 12.1 Stage 1 Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Sample Custody | SATISFACTORY | All samples received under proper chain of custody.<br>• Sampled: 16 October 2019 between 1258 and 1313; held on ice overnight<br>• Relinquished at FedEx: 17 October 2019 at 0849<br>• Arrived at Katahdin: 18 October 2019 at 0935 |
| Temperature | SATISFACTORY | Temperature 4 ± 2 °C<br>• Temperature at arrival: 4.3, 1.1, 3.2 °C (3 coolers)<br>Note: Temperature of cooler is below 2 °C, but samples were not frozen, which is acceptable. |
| Holding Time | SATISFACTORY | Holding time for preparation is 7 days.<br>• Sampled: 16 October 2019<br>• Prepared: 22 October 2019 (7 days)<br>• Analyzed: 28 October 2019 (6 days) |

### 12.2 Stage 2a Review

| Reviewed Item | Determination | Requirements/Comments |
|---|---|---|
| Method Blank (MB) | SATISFACTORY | • Perform one per preparatory batch.<br>• No analytes detected > ½ LOQ or > 1/10th the amount measured in any sample or 1/10th the regulatory limit, whichever is greater. |
| Laboratory Control Sample (LCS) | SATISFACTORY | • Perform one per preparatory batch.<br>• Recoveries must be within project limits, or lab in-house limits as specified in the project plan.<br>• Specified: Lab in-house limits |
| Field Duplicates (FD) | NA | • RPD of all analytes ≤ 30% (between sample and FD), or as specified by project limits.<br>• Were FDs collected? (Y/N): N |

### 12.3 Stage 2b Review

Not applicable.

### 12.4 Qualification Summary Table

No data was qualified based on validation.

## 13. Summary of Data Quality Indicators

This section provides an overall quantitative and qualitative assessment of the data and identifies potential sources of error, uncertainty, and bias that may affect the overall usability. The data quality indicators defined in the QAPP and presented in this section include precision, accuracy, representativeness, completeness, and sensitivity.

### Precision

Precision is defined as the degree of agreement between or among independent, similar, or repeated measures. Duplicate pairs such as MS/MSD, LCS/LCSD, laboratory duplicate, and field duplicate samples are evaluated as RPD. The relative percent difference (RPD) for these analyses is calculated as follows:

$$RPD = \frac{|S_1 - S_2|}{S_{avg}} \times 100\%$$

Where $S_1$ and $S_2$ = the observed concentration of analyte in the sample and its duplicate, and

$S_{avg}$ = the average of observed analyte concentration in the samples and its duplicate.

Measurements for which RPD is out of control limits are discussed in sections 4.4, 6.4, and 8.4. The accuracy of the data set is considered acceptable after qualification (flagging) of estimated results.

### Accuracy

Accuracy is the amount of agreement between a measured value and the true value. Accuracy, expressed as %Recovery (%R), was assessed for each method, analyte, and matrix, by comparing MS/MSD, LCS/LCSD, and surrogate recoveries to the method limits. Measurements for which accuracy is out of control limits are discussed in section 4.4, 5.4, 8.4, and 10.4. The accuracy of the data set is considered acceptable after qualification (flagging) of estimated results.

### Representativeness

Representativeness is a qualitative parameter that expresses the degree to which the sample data are characteristic of a population and is evaluated by reviewing the QC results of holding times and blank samples. Positive detects of compounds in the method blank samples identify compounds that may have been introduced into the samples during preparation, or analysis.

All samples for each method and matrix were evaluated for holding time compliance. All holding times and temperature requirements were met with the following exception: for total organotins, the extraction holding time criteria was exceeded by one day. All results were non-detect, and the non-detect data was qualified with UJ (section 8.4). The dissolved organotin samples were analyzed within holding times and results were also non-detect.

Method blanks were performed at the required frequency and contaminants were not detected in analyses, with two exceptions. For PCB congeners (section 7.4), various analytes are detected in the method blank at low concentrations, with some being > 1/10 the concentration detected in the parent sample. These results that were detected in the method blank were flagged as UJ in the parent sample. For NWTPH-Dx (Section 10.4), the o-terphenyl surrogate in the method blank recovered outside control limits, low-biased. Samples associated with this method blank were re-extracted outside of holding time with concurrent results. Both sets of data were reported, and the first set (within holding time) is recommended for use by this data validation report.

Additionally, a filter blank was performed for the dissolved metals analysis and zinc was detected in the filter blank above the LOQ and similar in concentration to the total metals and the filtered dissolved metals sample. The dissolved metals sample result for zinc was flagged as UJ and reported at the numerical value of the sample result (section 2.4).

For NWTPH-Gx (section 9.4), all samples had significant headspace, defined as a bubble greater than 6 mm in diameter, and detects were flagged J- and non-detects were flagged UJ.

The representativeness of the project data is considered acceptable after qualification (flagging) of estimated results.

### Completeness

Analytical completeness was calculated as defined in the QAPP and expressed as the percentage of measurements that were judged to be valid, i.e., not rejected, and acceptable for all intended date use. No data were rejected; analytical completeness for this sampling event was 100%.

### Sensitivity

Sensitivity is the ability of an analytical method or instrument to discriminate between measurement responses representing different concentrations. The sensitivity of the analytical methods (i.e., method reporting limits) identified for this project comply with the QAPP (USACE 2019a).

## 14. Conclusions

The overall assessment of data indicates that the data set met project requirements. Sample results that were qualified should be used with caution if results are close to projection decision limits or regulatory benchmarks. Based upon the data review performed, all results are considered valid and usable for all purposes.

## 15. References


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DoD, 2019. *DoD Quality Systems Manual for Environmental Laboratories*, Version 5.3, May 8.

United States Army Corps of Engineers (USACE), 2019a. *Work Plan with Quality Assurance Project Plan (WP-QAPP) Amendment 1 for Catch Basin Solids and Stormwater Sampling at Sandblast AOPC, Bradford Island, Cascade Locks, Oregon, March 4.*

USACE, 2019b. *Stormwater Sampling Field Report, Sandblast AOPC, Bradford Island, Cascade Locks, Oregon.* July 11.

United Stated Environmental Protection Agency (USEPA), 2009. *Guidance for Labeling Externally Validated Data for Superfund Use*, EPA 540-R-08-00. January 13.

USEPA, 2016. *National Functional Guidelines for High Resolution Superfund Methods Data Review*, EPA 542-B-16-001. April.

USEPA, 2017a. *National Functional Guidelines for Inorganic Superfund Methods Data Review*, EPA 540-R-2017-001. January.

USEPA, 2017b. *National Functional Guidelines for Organic Superfund Methods Data Review*, EPA 540-R-2017-002. January.

USPEA, 2016. *Quick Guide To Drinking Water Sample Collection*. September.

**Table 1. Sample Locations, Sample ID Numbers, and Sample Dates.**

| Analyses | OF-1 | OF-2 | Sample Date |
|---|---|---|---|
| Total and Dissolved Metals, EPA 200.8 | N | N; MS/MSD | 16 October 2019 |
| Total and Dissolved Mercury, EPA 7470A | N | N; MS/MSD | 16 October 2019 |
| PAHs, EPA 8270D SIM | N | N; MS/MSD | 16 October 2019 |
| PCB Congeners, EPA 1668C | N | N; MS/MSD | 16 October 2019 |
| Organochlorine Pesticides, EPA 8081B | N | N; MS/MSD | 16 October 2019 |
| Total Organotins, PSEP | N | N; MS/MSD | 16 October 2019 |
| Gasoline-Range Petroleum Products, NWTPH-Gx | N | N; MS/MSD | 16 October 2019 |
| Diesel-Range Petroleum Products, NWTPH-Dx | N | N; MS/MSD | 16 October 2019 |
| SVOCs, EPA 8270D | N | N; MS/MSD | 16 October 2019 |
| Hardness as $CaCO_3$, EPA 200.8 | N | N | 16 October 2019 |
| Dissolved Organic Carbon, EPA 415.1 | N | N | 16 October 2019 |
| Total Suspended Solids, SM 2540D | N | N | 16 October 2019 |
| Temperature, Field Measurement | F | F | 16 October 2019 |
| pH, Field Measurement | F | F | 16 October 2019 |

N = normal sample; MS/MSD = extra sample volume sufficient for MS/MSD was obtained; F = field measurement.

**Table 2. Limit and Data Qualifier Flag Definitions.**

| Limit | Definition |
|---|---|
| LOQ | Limit of Quantitation: The smallest concentration that produces a quantitative result with known and recorded precision and bias. For DoD/DOE projects, the LOQ shall be set at or above the concentration of the lowest initial calibration standard and within the calibration range. |
| LOD | Limit of Detection: The smallest concentration of a substance that must be present in a sample in order to be detected at the DL with 99% confidence. At the LOD, the false negative rate (Type II error) is 1%. A LOD may be used as the lowest concentration for reliably reporting a non-detect of a specific analyte in a specific matrix with a specific method at 99% confidence. A LOD is typically 2x to 4x the DL. |
| DL | Detection Limit: The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration with 99% confidence. At the DL, the false positive rate (Type I error) is 1%. A DL may be used as the lowest concentration for reliably reporting a detection of a specific analyte in a specific matrix with a specific method with 99% confidence. |
| **Flag** | **Definition** |
| J | The analyte was detected above the DL. The reported result is an estimated value with an unknown bias. The result receives a J-flag if it is below the LOQ, or due to other quality reasons. |
| J+ | The analyte was detected above the DL. The result is an estimated quantity, but the result may be biased high. The result receives a J-flag if it is below the LOQ, or due to other quality reasons. |
| J- | The analyte was detected above the DL. The result is an estimated quantity, but the result may be biased low. The result receives a J-flag if it is below the LOQ, or due to other quality reasons. |
| U | The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample. |
| UJ | The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate. |
| X | The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended. |
| R | The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample. |

Attachment 1:

**Table 3. Validated Data (Detects are Bold).**

| | OF-1 (CB-1) | | | | | | | OF-2 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Bold Number = Detected** (Not bold = non-detect) | | | | | | | | | | | | | | |
| **Method: 200.8 - Total Metals (ICP/MS)** | | | | | | | | | | | | | | |
| Analyte | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac |
| Antimony | **0.330** | | 0.20 | 0.10 | 0.011 | µg/L | 1 | **0.066** | **J** | 0.20 | 0.10 | 0.011 | µg/L | 1 |
| Arsenic | 0.80 | U | 1.0 | 0.80 | 0.45 | µg/L | 1 | 0.80 | U | 1.0 | 0.80 | 0.45 | µg/L | 1 |
| Cadmium | **0.152** | **J** | 0.20 | 0.040 | 0.0059 | µg/L | 1 | **0.030** | **J** | 0.20 | 0.040 | 0.0059 | µg/L | 1 |
| Chromium | **3.24** | | 1.0 | 0.80 | 0.045 | µg/L | 1 | **0.835** | **J** | 1.0 | 0.80 | 0.045 | µg/L | 1 |
| Copper | **14.0** | | 0.60 | 0.40 | 0.037 | µg/L | 1 | **51.6** | | 0.60 | 0.40 | 0.037 | µg/L | 1 |
| Lead | **15.7** | | 0.20 | 0.10 | 0.015 | µg/L | 1 | **1.76** | | 0.20 | 0.10 | 0.015 | µg/L | 1 |
| Nickel | **3.47** | | 0.40 | 0.24 | 0.030 | µg/L | 1 | **0.667** | | 0.40 | 0.24 | 0.030 | µg/L | 1 |
| Selenium | **0.055** | **J** | 1.0 | 0.60 | 0.037 | µg/L | 1 | 0.60 | U | 1.0 | 0.60 | 0.037 | µg/L | 1 |
| Silver | 0.080 | U | 0.20 | 0.080 | 0.010 | µg/L | 1 | 0.080 | U | 0.20 | 0.080 | 0.010 | µg/L | 1 |
| Zinc | **22.3** | | 2.0 | 1.6 | 0.78 | µg/L | 1 | **40.3** | | 2.0 | 1.6 | 0.78 | µg/L | 1 |
| **Method: 200.8 - Dissolved Metals (ICP/MS)** | | | | | | | | | | | | | | |
| Analyte | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac |
| Antimony | **0.275** | | 0.20 | 0.10 | 0.011 | µg/L | 1 | **0.085** | **J** | 0.20 | 0.10 | 0.011 | µg/L | 1 |
| Arsenic | 0.80 | U | 1.0 | 0.80 | 0.45 | µg/L | 1 | 0.80 | U | 1.0 | 0.80 | 0.45 | µg/L | 1 |
| Cadmium | **0.069** | **J** | 0.20 | 0.040 | 0.0059 | µg/L | 1 | **0.012** | **J** | 0.20 | 0.040 | 0.0059 | µg/L | 1 |
| Chromium | **1.41** | | 1.0 | 0.80 | 0.045 | µg/L | 1 | **0.509** | **J** | 1.0 | 0.80 | 0.045 | µg/L | 1 |
| Copper | **12.9** | | 0.60 | 0.40 | 0.037 | µg/L | 1 | **35.8** | | 0.60 | 0.40 | 0.037 | µg/L | 1 |
| Lead | **1.02** | | 0.20 | 0.10 | 0.015 | µg/L | 1 | **0.233** | | 0.20 | 0.10 | 0.015 | µg/L | 1 |
| Nickel | **2.81** | | 0.40 | 0.24 | 0.030 | µg/L | 1 | **0.404** | | 0.40 | 0.24 | 0.030 | µg/L | 1 |
| Selenium | **0.052** | **J** | 1.0 | 0.60 | 0.037 | µg/L | 1 | **0.12** | **J** | 1.0 | 0.60 | 0.037 | µg/L | 1 |
| Silver | 0.080 | U | 0.20 | 0.080 | 0.010 | µg/L | 1 | 0.080 | U | 0.20 | 0.080 | 0.010 | µg/L | 1 |
| Zinc | **17.1** | **UJ** | 2.0 | 1.6 | 0.78 | µg/L | 1 | **29.3** | **UJ** | 2.0 | 1.6 | 0.78 | µg/L | 1 |
| **Method: 7470 - Total Mercury (CVAA)** | | | | | | | | | | | | | | |
| Analyte | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac |
| Mercury | **0.014** | **J** | 0.20 | 0.10 | 0.013 | µg/L | 1 | **0.018** | **JA** | 0.20 | 0.10 | 0.013 | µg/L | 1 |
| **Method: 7470 - Dissolved Mercury (CVAA)** | | | | | | | | | | | | | | |
| Analyte | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac |
| Mercury | 0.10 | U | 0.20 | 0.10 | 0.013 | µg/L | 1 | **0.015** | **J** | 0.20 | 0.10 | 0.013 | µg/L | 1 |
| **Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)** | | | | | | | | | | | | | | |
| Analyte | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac |
| Di-n-butylbenzylphthalate | 1.0 | U | 2.0 | 1.0 | 0.83 | µg/L | 1 | 0.99 | U | 2.0 | 0.99 | 0.82 | µg/L | 1 |
| Bis(2-ethylhexyl)phthalate | 0.50 | UJ | 1.0 | 0.50 | 0.50 | µg/L | 1 | 0.50 | UJ | 0.99 | 0.50 | 0.50 | µg/L | 1 |
| Carbazole | 0.50 | U | 1.0 | 0.50 | 0.19 | µg/L | 1 | 0.50 | U | 0.99 | 0.50 | 0.19 | µg/L | 1 |
| Phenol | 0.50 | U | 1.0 | 0.50 | 0.12 | µg/L | 1 | 0.50 | U | 0.99 | 0.50 | 0.12 | µg/L | 1 |
| Butylbenzylphthalate | 0.50 | U | 1.0 | 0.50 | 0.13 | µg/L | 1 | 0.50 | U | 0.99 | 0.50 | 0.13 | µg/L | 1 |
| **Method: 8270D SIM - Polycyclic Aromatic Hydrocarbons (PAHs) by GC/MS SIM** | | | | | | | | | | | | | | |
| Analyte | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac |
| Naphthalene | 0.086 | UJ | 0.11 | | 0.027 | ug/L | 1 | 0.094 | UJ | 0.12 | | 0.029 | ug/L | 1 |
| 2-Methylnaphthalene | **0.0081** | **J-** | 0.032 | | 0.0065 | ug/L | 1 | **0.013** | **J** | 0.035 | | 0.0071 | ug/L | 1 |
| Acenaphthylene | 0.022 | UJ | 0.032 | | 0.0065 | ug/L | 1 | 0.024 | UJ | 0.035 | | 0.0071 | ug/L | 1 |
| Acenaphthene | 0.022 | UJ | 0.032 | | 0.0065 | ug/L | 1 | 0.024 | UJ | 0.035 | | 0.0071 | ug/L | 1 |
| Fluorene | 0.022 | UJ | 0.065 | | 0.0065 | ug/L | 1 | 0.024 | UJ | 0.071 | | 0.0071 | ug/L | 1 |
| Phenanthrene | 0.043 | UJ | 0.065 | | 0.018 | ug/L | 1 | 0.047 | UJ | 0.071 | | 0.020 | ug/L | 1 |
| Anthracene | 0.022 | UJ | 0.065 | | 0.0065 | ug/L | 1 | 0.024 | UJ | 0.071 | | 0.0071 | ug/L | 1 |
| Fluoranthene | **0.032** | **J-** | 0.065 | | 0.016 | ug/L | 1 | **0.041** | **J** | 0.071 | | 0.018 | ug/L | 1 |
| Pyrene | **0.025** | **J-** | 0.032 | | 0.0065 | ug/L | 1 | **0.034** | **J** | 0.035 | | 0.0071 | ug/L | 1 |
| Benzo[a]anthracene | **0.019** | **J-** | 0.065 | | 0.0065 | ug/L | 1 | **0.022** | **J** | 0.071 | | 0.0071 | ug/L | 1 |
| Chrysene | **0.02** | **J-** | 0.065 | | 0.016 | ug/L | 1 | **0.028** | **J** | 0.071 | | 0.018 | ug/L | 1 |
| Benzo[b]fluoranthene | **0.026** | **J-** | 0.065 | | 0.014 | ug/L | 1 | **0.018** | **J-** | 0.071 | | 0.015 | ug/L | 1 |
| Benzo[k]fluoranthene | **0.0091** | **J-** | 0.065 | | 0.0065 | ug/L | 1 | **0.0097** | **J** | 0.071 | | 0.0071 | ug/L | 1 |
| Benzo[a]pyrene | **0.013** | **J-** | 0.065 | | 0.0065 | ug/L | 1 | **0.012** | **J** | 0.071 | | 0.0071 | ug/L | 1 |
| Indeno[1,2,3-cd]pyrene | **0.014** | **J-** | 0.032 | | 0.0065 | ug/L | 1 | **0.011** | **J** | 0.035 | | 0.0071 | ug/L | 1 |
| Dibenz(a,h)anthracene | 0.043 | UJ | 0.065 | | 0.014 | ug/L | 1 | 0.047 | U | 0.071 | | 0.015 | ug/L | 1 |
| Benzo[g,h,i]perylene | **0.011** | **J-** | 0.065 | | 0.0065 | ug/L | 1 | **0.0079** | **J** | 0.071 | | 0.0071 | ug/L | 1 |
| **Method: 8081B - Organochlorine Pesticides (GC)** | | | | | | | | | | | | | | |
| Analyte | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac |
| Gamma-BHC | 0.0051 | U | 0.010 | 0.0051 | 0.0015 | ug/L | 1 | 0.0052 | U | 0.010 | 0.0052 | 0.0015 | ug/L | 1 |
| Heptachlor | 0.0051 | U | 0.010 | 0.0051 | 0.0016 | ug/L | 1 | 0.0052 | U | 0.010 | 0.0052 | 0.0016 | ug/L | 1 |
| Aldrin | **0.012** | | 0.010 | 0.0051 | 0.0015 | ug/L | 1 | **0.0032** | **J** | 0.010 | 0.0052 | 0.0015 | ug/L | 1 |
| Heptachlor Epoxide | 0.0051 | U | 0.010 | 0.0051 | 0.0015 | ug/L | 1 | 0.0052 | U | 0.010 | 0.0052 | 0.0015 | ug/L | 1 |
| Endosulfan I | 0.0051 | U | 0.010 | 0.0051 | 0.0013 | ug/L | 1 | 0.0052 | U | 0.010 | 0.0052 | 0.0013 | ug/L | 1 |
| Gamma-Chlordane | 0.0051 | U | 0.010 | 0.0051 | 0.0012 | ug/L | 1 | 0.0052 | U | 0.010 | 0.0052 | 0.0012 | ug/L | 1 |
| Alpha-Chlordane | 0.0051 | U | 0.010 | 0.0051 | 0.0016 | ug/L | 1 | 0.0052 | U | 0.010 | 0.0052 | 0.0016 | ug/L | 1 |
| 4,4′-DDE | 0.010 | U | 0.020 | 0.010 | 0.0010 | ug/L | 1 | 0.01 | U | 0.021 | 0.010 | 0.0010 | ug/L | 1 |
| Dieldrin | 0.010 | U | 0.020 | 0.010 | 0.0013 | ug/L | 1 | 0.01 | U | 0.021 | 0.010 | 0.0013 | ug/L | 1 |
| Endrin | 0.010 | U | 0.020 | 0.010 | 0.0017 | ug/L | 1 | 0.01 | U | 0.021 | 0.010 | 0.0017 | ug/L | 1 |
| 4,4′-DDD | 0.010 | U | 0.020 | 0.010 | 0.0018 | ug/L | 1 | 0.01 | U | 0.021 | 0.010 | 0.0018 | ug/L | 1 |
| Endosulfan II | 0.010 | U | 0.020 | 0.010 | 0.0012 | ug/L | 1 | 0.01 | U | 0.021 | 0.010 | 0.0012 | ug/L | 1 |
| 4,4′-DDT | 0.010 | U | 0.020 | 0.010 | 0.0018 | ug/L | 1 | 0.01 | U | 0.021 | 0.010 | 0.0018 | ug/L | 1 |
| Endrin Aldehyde | 0.010 | U | 0.020 | 0.010 | 0.0013 | ug/L | 1 | 0.01 | U | 0.021 | 0.010 | 0.0013 | ug/L | 1 |
| Endosulfan Sulfate | 0.010 | U | 0.020 | 0.010 | 0.0014 | ug/L | 1 | 0.01 | U | 0.021 | 0.010 | 0.0014 | ug/L | 1 |
| Methoxychlor | 0.051 | U | 0.10 | 0.051 | 0.0017 | ug/L | 1 | 0.052 | U | 0.10 | 0.052 | 0.0017 | ug/L | 1 |
| Endrin Ketone | **0.0053** | **J** | 0.020 | 0.010 | 0.0016 | ug/L | 1 | 0.01 | U | 0.021 | 0.010 | 0.0016 | ug/L | 1 |
| 2,4′-DDD | 0.01 | U | 0.020 | 0.010 | 0.0049 | ug/L | 1 | 0.01 | U | 0.021 | 0.010 | 0.0049 | ug/L | 1 |
| 2,4′-DDE | 0.01 | U | 0.020 | 0.010 | 0.0047 | ug/L | 1 | 0.01 | U | 0.021 | 0.010 | 0.0047 | ug/L | 1 |
| 2,4′-DDT | 0.01 | U | 0.020 | 0.010 | 0.0047 | ug/L | 1 | 0.01 | U | 0.021 | 0.010 | 0.0047 | ug/L | 1 |
| Total DDDs | 0.02 | U | 0.041 | 0.020 | 0.0018 | ug/L | 1 | 0.021 | U | 0.041 | 0.021 | 0.0018 | ug/L | 1 |
| Total DDEs | 0.02 | U | 0.041 | 0.020 | 0.0010 | ug/L | 1 | 0.021 | U | 0.041 | 0.021 | 0.0010 | ug/L | 1 |
| Total DDTs | 0.02 | U | 0.041 | 0.020 | 0.0018 | ug/L | 1 | 0.021 | U | 0.041 | 0.021 | 0.0018 | ug/L | 1 |
| Oxychlordane | 0.01 | U | 0.020 | 0.010 | 0.0053 | ug/L | 1 | **0.011** | **J** | 0.021 | 0.010 | 0.0054 | ug/L | 1 |
| **Method: PSEP/Krone - Total Organotins (GC/MS)** | | | | | | | | | | | | | | |
| Analyte | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac |
| Dibutyltin | 0.16 | UJ | 0.32 | | 0.060 | ug/L | 1 | 0.17 | UJ | 0.33 | | 0.062 | ug/L | 1 |
| Monobutyltin | 0.13 | UJ | 0.32 | | 0.066 | ug/L | 1 | 0.14 | UJ | 0.33 | | 0.067 | ug/L | 1 |
| Tetra-n-butyltin | 0.22 | UJ | 0.32 | | 0.11 | ug/L | 1 | 0.22 | UJ | 0.33 | | 0.11 | ug/L | 1 |
| Tributyltin | 0.19 | UJ | 0.32 | | 0.050 | ug/L | 1 | 0.20 | UJ | 0.33 | | 0.051 | ug/L | 1 |
| **Method: PSEP/Krone - Dissolved Organotins (GC/MS)** | | | | | | | | | | | | | | |
| Analyte | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac |
| Dibutyltin | 0.16 | U | 0.32 | | 0.060 | ug/L | 1 | 0.15 | U | 0.30 | | 0.057 | ug/L | 1 |
| Monobutyltin | 0.13 | U | 0.32 | | 0.065 | ug/L | 1 | 0.13 | UJ | 0.30 | | 0.062 | ug/L | 1 |
| Tetra-n-butyltin | 0.21 | U | 0.32 | | 0.11 | ug/L | 1 | 0.20 | U | 0.30 | | 0.10 | ug/L | 1 |
| Tributyltin | 0.19 | U | 0.32 | | 0.049 | ug/L | 1 | 0.18 | U | 0.30 | | 0.046 | ug/L | 1 |
| **Method: NWTPH-Gx - Gasoline-Range Petroleum Products (GC)** | | | | | | | | | | | | | | |
| Analyte | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac |
| Gasoline | 0.20 | UJ | 0.25 | | 0.10 | mg/L | 1 | 0.20 | UJ | 0.25 | | 0.10 | ug/L | 1 |
| **Method: NWTPH-Dx - Diesel-Range Petroleum Products (GC)** | | | | | | | | | | | | | | |
| Analyte | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac |
| #2 Diesel (C10-C24) | **0.16** | | 0.13 | | 0.074 | mg/L | 1 | **0.11** | **J+** | 0.12 | | 0.070 | ug/L | 1 |
| **General Chemistry** | | | | | | | | | | | | | | |
| Analyte | Result | Qualifier | LOQ | LOD | MDL | Unit | | Result | Qualifier | LOQ | LOD | MDL | Unit | |
| Total Hardness, EPA 200.8 | **19600** | | 130 | 110 | 17 | µg/L | | **13000** | | 130 | 110 | 17 | µg/L | |
| Total Suspended Solids, SM 2540D | **3.2** | | 2.0 | 1.5 | 0.72 | mg/L | | **13** | | 2.0 | 1.5 | 0.72 | mg/L | |
| Dissolved Organic Carbon, EPA 415.1 | **6.1** | | 1.0 | 0.50 | 0.32 | mg/L | | **2.5** | | 1.0 | 0.50 | 0.32 | mg/L | |
| **Method: 1668C - Polychorinated Biphenyl Congeners (HRGC/HRMS)** | | | | | | | | | | | | | | |
| Analyte | Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac | Result | Qualifier | LOQ | | DL | Unit | Dil Fac |
| PCB-1 | 9.8 | U | 200 | | 0.46 | pg/L | 1 | **2.3** | **J** | 200 | | 0.51 | pg/L | 1 |
| PCB-2 | 20 | U | 200 | | 0.37 | pg/L | 1 | 20 | U | 200 | | 0.41 | pg/L | 1 |
| PCB-3 | **1.0** | **J** | 200 | | 0.42 | pg/L | 1 | **2.1** | **J** | 200 | | 0.46 | pg/L | 1 |
| PCB-4 | 25 | U | 200 | | 13 | pg/L | 1 | 25 | U | 200 | | 20 | pg/L | 1 |
| PCB-5 | 25 | U | 200 | | 15 | pg/L | 1 | 25 | U | 200 | | 11 | pg/L | 1 |
| PCB-6 | 25 | U | 200 | | 12 | pg/L | 1 | 25 | U | 200 | | 8.9 | pg/L | 1 |
| PCB-7 | 25 | U | 200 | | 14 | pg/L | 1 | 25 | U | 200 | | 10 | pg/L | 1 |

| Filter Blank | | | | | | |
|---|---|---|---|---|---|---|
| Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac |
| **0.016** | **J** | **0.20** | **0.10** | **0.011** | **µg/L** | **1** |
| 0.80 | U | 1.0 | 0.80 | 0.45 | µg/L | 1 |
| 0.040 | U | **0.20** | **0.040** | **0.0059** | **µg/L** | **1** |
| **0.10** | **J** | **1.0** | **0.80** | **0.045** | **µg/L** | **1** |
| **0.14** | **J** | 0.60 | 0.40 | 0.037 | µg/L | 1 |
| **0.051** | **J** | **0.20** | **0.10** | **0.015** | **µg/L** | **1** |
| **0.17** | **J** | **0.40** | **0.24** | **0.030** | **µg/L** | **1** |
| 0.60 | U | 1.0 | 0.60 | 0.037 | µg/L | 1 |
| 0.080 | U | 0.20 | 0.080 | 0.010 | µg/L | 1 |
| **15.8** | | **2.0** | **1.6** | **0.78** | **µg/L** | **1** |

| Filter Blank | | | | | | |
|---|---|---|---|---|---|---|
| Result | Qualifier | LOQ | LOD | MDL | Unit | Dil Fac |
| **0.020** | **J** | 0.20 | 0.10 | 0.013 | µg/L | 1 |

| Filter Blank | | | | | |
|---|---|---|---|---|---|
| Result | Qualifier | LOQ | LOD | MDL | Unit |
| **0.71** | **J** | 1.0 | 0.50 | 0.32 | mg/L |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PCB-8 | | 25 | U | 200 | | 12 | pg/L | 1 | | 25 | U | 200 | | 8.4 | pg/L | 1 |
| PCB-9 | | 49 | U | 200 | | 14 | pg/L | 1 | | 51 | U | 200 | | 9.7 | pg/L | 1 |
| PCB-10 | | 49 | U | 200 | | 9.2 | pg/L | 1 | | 51 | U | 200 | | 13 | pg/L | 1 |
| PCB-11 | | 25 | U | 200 | | 14 | pg/L | 1 | | **35** | **J** | 200 | | 9.9 | pg/L | 1 |
| PCB-12 | | 39 | U | 390 | | 15 | pg/L | 1 | | 40 | U | 400 | | 11 | pg/L | 1 |
| PCB-13 | | 39 | U | 390 | | 15 | pg/L | 1 | | 40 | U | 400 | | 11 | pg/L | 1 |
| PCB-14 | | 25 | U | 200 | | 15 | pg/L | 1 | | 25 | U | 200 | | 11 | pg/L | 1 |
| PCB-15 | | 20 | U | 200 | | 16 | pg/L | 1 | | 20 | U | 200 | | 11 | pg/L | 1 |
| PCB-16 | | 49 | U | 200 | | 2.3 | pg/L | 1 | | 51 | U | 200 | | 3.0 | pg/L | 1 |
| PCB-17 | | 9.8 | U | 200 | | 2.4 | pg/L | 1 | | **4.5** | **J** | 200 | | 3.1 | pg/L | 1 |
| PCB-18 | | **5.2** | **J** | 390 | | 1.6 | pg/L | 1 | | **6.2** | **J** | 400 | | 2.1 | pg/L | 1 |
| PCB-19 | | 9.8 | U | 200 | | 2.2 | pg/L | 1 | | 10 | U | 200 | | 3.0 | pg/L | 1 |
| PCB-20 | | **8.7** | **J** | 390 | | 1.6 | pg/L | 1 | | **18** | **J** | 400 | | 2.2 | pg/L | 1 |
| PCB-21 | | **5.0** | **J** | 390 | | 1.6 | pg/L | 1 | | **12** | **J** | 400 | | 2.2 | pg/L | 1 |
| PCB-22 | | **3.1** | **J** | 200 | | 1.4 | pg/L | 1 | | **6.5** | **J** | 200 | | 2.0 | pg/L | 1 |
| PCB-23 | | 20 | U | 200 | | 1.6 | pg/L | 1 | | 20 | U | 200 | | 2.2 | pg/L | 1 |
| PCB-24 | | 20 | U | 200 | | 1.6 | pg/L | 1 | | 20 | U | 200 | | 2.1 | pg/L | 1 |
| PCB-25 | | 20 | U | 200 | | 1.3 | pg/L | 1 | | 20 | U | 200 | | 1.9 | pg/L | 1 |
| PCB-26 | | 39 | U | 390 | | 1.7 | pg/L | 1 | | 40 | U | 400 | | 2.3 | pg/L | 1 |
| PCB-27 | | 20 | U | 200 | | 1.7 | pg/L | 1 | | 20 | U | 200 | | 2.3 | pg/L | 1 |
| PCB-28 | | **8.7** | **J** | 390 | | 1.6 | pg/L | 1 | | **18** | **J** | 400 | | 2.2 | pg/L | 1 |
| PCB-29 | | 39 | U | 390 | | 1.7 | pg/L | 1 | | 40 | U | 400 | | 2.3 | pg/L | 1 |
| PCB-30 | | **5.2** | **J** | 390 | | 1.6 | pg/L | 1 | | **6.2** | **J** | 400 | | 2.1 | pg/L | 1 |
| PCB-31 | | **8.2** | **J** | 200 | | 1.7 | pg/L | 1 | | **19** | **J** | 200 | | 2.4 | pg/L | 1 |
| PCB-32 | | 9.8 | U | 200 | | 1.5 | pg/L | 1 | | 10 | U | 200 | | 2.0 | pg/L | 1 |
| PCB-33 | | **5.0** | **J** | 390 | | 1.6 | pg/L | 1 | | **12** | **J** | 400 | | 2.2 | pg/L | 1 |
| PCB-34 | | 20 | U | 200 | | 1.8 | pg/L | 1 | | 20 | U | 200 | | 2.5 | pg/L | 1 |
| PCB-35 | | 9.8 | U | 200 | | 1.7 | pg/L | 1 | | 10 | U | 200 | | 2.4 | pg/L | 1 |
| PCB-36 | | 9.8 | U | 200 | | 1.5 | pg/L | 1 | | 10 | U | 200 | | 2.1 | pg/L | 1 |
| PCB-37 | | 9.8 | U | 200 | | 2.1 | pg/L | 1 | | **12** | **J** | 200 | | 2.8 | pg/L | 1 |
| PCB-38 | | 20 | U | 200 | | 1.6 | pg/L | 1 | | 20 | U | 200 | | 2.2 | pg/L | 1 |
| PCB-39 | | 9.8 | U | 200 | | 1.7 | pg/L | 1 | | 10 | U | 200 | | 2.3 | pg/L | 1 |
| PCB-40 | | **5.3** | **J** | 390 | | 1.3 | pg/L | 1 | | **7.1** | **J** | 400 | | 0.97 | pg/L | 1 |
| PCB-41 | | 9.8 | U | 200 | | 1.9 | pg/L | 1 | | 10 | U | 200 | | 1.4 | pg/L | 1 |
| PCB-42 | | 20 | U | 200 | | 1.5 | pg/L | 1 | | **4.4** | **J** | 200 | | 1.1 | pg/L | 1 |
| PCB-43 | | 9.8 | U | 200 | | 1.5 | pg/L | 1 | | 10 | U | 200 | | 1.1 | pg/L | 1 |
| PCB-44 | | **22** | **UJ** | 590 | | 1.3 | pg/L | 1 | | **17** | **J** | 610 | | 0.97 | pg/L | 1 |
| PCB-45 | | 20 | U | 200 | | 2.1 | pg/L | 1 | | **2.3** | **UJ** | 200 | | 1.5 | pg/L | 1 |
| PCB-46 | | 20 | U | 200 | | 1.8 | pg/L | 1 | | 20 | U | 200 | | 1.3 | pg/L | 1 |
| PCB-47 | | **22** | **UJ** | 590 | | 1.3 | pg/L | 1 | | **17** | **UJ** | 610 | | 0.97 | pg/L | 1 |
| PCB-48 | | 20 | U | 200 | | 1.5 | pg/L | 1 | | **3.4** | **J** | 200 | | 1.1 | pg/L | 1 |
| PCB-49 | | **7.9** | **J** | 390 | | 1.2 | pg/L | 1 | | **6.2** | **J** | 400 | | 0.91 | pg/L | 1 |
| PCB-50 | | 39 | U | 390 | | 1.5 | pg/L | 1 | | **1.7** | **J** | 400 | | 1.1 | pg/L | 1 |
| PCB-51 | | 20 | U | 200 | | 1.4 | pg/L | 1 | | **2.1** | **J** | 200 | | 0.99 | pg/L | 1 |
| PCB-52 | | **32** | **J** | 200 | | 1.4 | pg/L | 1 | | **13** | **UJ** | 200 | | 1.0 | pg/L | 1 |
| PCB-53 | | 39 | U | 390 | | 1.5 | pg/L | 1 | | **1.7** | **J** | 400 | | 1.1 | pg/L | 1 |
| PCB-54 | | 9.8 | U | 200 | | 0.99 | pg/L | 1 | | 10 | U | 200 | | 1.1 | pg/L | 1 |
| PCB-55 | | 9.8 | U | 200 | | 1.1 | pg/L | 1 | | 10 | U | 200 | | 0.7 | pg/L | 1 |
| PCB-56 | | **4.4** | **J** | 200 | | 1.3 | pg/L | 1 | | **8.5** | **J** | 200 | | 0.81 | pg/L | 1 |
| PCB-57 | | 9.8 | U | 200 | | 1.3 | pg/L | 1 | | 10 | U | 200 | | 0.82 | pg/L | 1 |
| PCB-58 | | **5.9** | **J** | 200 | | 1.2 | pg/L | 1 | | 20 | U | 200 | | 0.75 | pg/L | 1 |
| PCB-59 | | 59 | U | 590 | | 1.2 | pg/L | 1 | | **1.6** | **J** | 610 | | 0.85 | pg/L | 1 |
| PCB-60 | | 20 | U | 200 | | 1.4 | pg/L | 1 | | **4.5** | **J** | 200 | | 0.90 | pg/L | 1 |
| PCB-61 | | **27** | **J** | 790 | | 1.2 | pg/L | 1 | | **24** | **J** | 810 | | 0.78 | pg/L | 1 |
| PCB-62 | | 59 | U | 590 | | 1.2 | pg/L | 1 | | **1.6** | **J** | 610 | | 0.85 | pg/L | 1 |
| PCB-63 | | 20 | U | 200 | | 1.4 | pg/L | 1 | | 20 | U | 200 | | 0.91 | pg/L | 1 |
| PCB-64 | | **5.0** | **J** | 200 | | 1.1 | pg/L | 1 | | **7.1** | **J** | 200 | | 0.78 | pg/L | 1 |
| PCB-65 | | **22** | **J** | 590 | | 1.3 | pg/L | 1 | | **17** | **UJ** | 610 | | 0.97 | pg/L | 1 |
| PCB-66 | | **11** | **J** | 200 | | 1.3 | pg/L | 1 | | **16** | **J** | 200 | | 0.84 | pg/L | 1 |
| PCB-67 | | 20 | U | 200 | | 1.1 | pg/L | 1 | | 20 | U | 200 | | 0.68 | pg/L | 1 |
| PCB-68 | | 20 | U | 200 | | 1.2 | pg/L | 1 | | 20 | U | 200 | | 0.80 | pg/L | 1 |
| PCB-69 | | **7.9** | **J** | 390 | | 1.2 | pg/L | 1 | | **6.2** | **J** | 400 | | 0.91 | pg/L | 1 |
| PCB-70 | | **27** | **J** | 790 | | 1.2 | pg/L | 1 | | **24** | **J** | 810 | | 0.78 | pg/L | 1 |
| PCB-71 | | **5.3** | **J** | 390 | | 1.3 | pg/L | 1 | | **7.1** | **J** | 400 | | 0.97 | pg/L | 1 |
| PCB-72 | | 20 | U | 200 | | 1.2 | pg/L | 1 | | 20 | U | 200 | | 0.76 | pg/L | 1 |
| PCB-73 | | 20 | U | 200 | | 1.1 | pg/L | 1 | | 20 | U | 200 | | 0.78 | pg/L | 1 |
| PCB-74 | | **27** | **J** | 790 | | 1.2 | pg/L | 1 | | **24** | **J** | 810 | | 0.78 | pg/L | 1 |
| PCB-75 | | 59 | U | 590 | | 1.2 | pg/L | 1 | | **1.6** | **J** | 610 | | 0.85 | pg/L | 1 |
| PCB-76 | | **27** | **J** | 790 | | 1.2 | pg/L | 1 | | **24** | **J** | 810 | | 0.78 | pg/L | 1 |
| PCB-77 | | **5.4** | **J** | 20 | | 2.0 | pg/L | 1 | | **3.7** | **J** | 20 | | 1.2 | pg/L | 1 |
| PCB-78 | | 9.8 | U | 200 | | 1.4 | pg/L | 1 | | 10 | U | 200 | | 0.88 | pg/L | 1 |
| PCB-79 | | 9.8 | U | 200 | | 1.2 | pg/L | 1 | | 10 | U | 200 | | 0.78 | pg/L | 1 |
| PCB-80 | | 9.8 | U | 200 | | 1.3 | pg/L | 1 | | 10 | U | 200 | | 0.81 | pg/L | 1 |
| PCB-81 | | 9.8 | U | 20 | | 2.0 | pg/L | 1 | | 10 | U | 20 | | 1.3 | pg/L | 1 |
| PCB-82 | | **14** | **J** | 200 | | 7.1 | pg/L | 1 | | 10 | U | 200 | | 1.4 | pg/L | 1 |
| PCB-83 | | **12** | **J** | 200 | | 9.8 | pg/L | 1 | | 20 | U | 200 | | 2.0 | pg/L | 1 |
| PCB-84 | | **44** | **J** | 200 | | 8.1 | pg/L | 1 | | **4.8** | **J** | 200 | | 1.6 | pg/L | 1 |
| PCB-85 | | **18** | **J** | 590 | | 5.5 | pg/L | 1 | | **2.4** | **J** | 610 | | 1.1 | pg/L | 1 |
| PCB-86 | | **110** | **J** | 1200 | | 5.3 | pg/L | 1 | | **14** | **J** | 1200 | | 1.1 | pg/L | 1 |
| PCB-87 | | **110** | **J** | 1200 | | 5.3 | pg/L | 1 | | **14** | **J** | 1200 | | 1.1 | pg/L | 1 |
| PCB-88 | | **17** | **J** | 390 | | 6.9 | pg/L | 1 | | **3.0** | **J** | 400 | | 1.4 | pg/L | 1 |
| PCB-89 | | 9.8 | U | 200 | | 6.4 | pg/L | 1 | | 10 | U | 200 | | 1.3 | pg/L | 1 |
| PCB-90 | | **290** | **J** | 590 | | 5.6 | pg/L | 1 | | **26** | **J** | 610 | | 1.1 | pg/L | 1 |
| PCB-91 | | **17** | **J** | 390 | | 6.9 | pg/L | 1 | | **3.0** | **J** | 400 | | 1.4 | pg/L | 1 |
| PCB-92 | | **42** | **J** | 200 | | 7.0 | pg/L | 1 | | **4.3** | **J** | 200 | | 1.4 | pg/L | 1 |
| PCB-93 | | 20 | U | 390 | | 6.8 | pg/L | 1 | | 20 | U | 400 | | 1.4 | pg/L | 1 |
| PCB-94 | | 20 | U | 200 | | 7.6 | pg/L | 1 | | 20 | U | 200 | | 1.5 | pg/L | 1 |
| PCB-95 | | **240** | | 200 | | 7.0 | pg/L | 1 | | **19** | **J** | 200 | | 1.4 | pg/L | 1 |
| PCB-96 | | 20 | U | 200 | | 0.53 | pg/L | 1 | | 20 | U | 200 | | 0.49 | pg/L | 1 |
| PCB-97 | | **110** | **J** | 1200 | | 5.3 | pg/L | 1 | | **14** | **J** | 1200 | | 1.1 | pg/L | 1 |
| PCB-98 | | 20 | U | 390 | | 5.6 | pg/L | 1 | | 20 | U | 400 | | 1.1 | pg/L | 1 |
| PCB-99 | | **42** | **J** | 200 | | 5.0 | pg/L | 1 | | **5.4** | **J** | 200 | | 2.0 | pg/L | 1 |
| PCB-100 | | 20 | U | 390 | | 6.8 | pg/L | 1 | | 20 | U | 400 | | 1.4 | pg/L | 1 |
| PCB-101 | | **290** | **J** | 590 | | 5.6 | pg/L | 1 | | **26** | **J** | 610 | | 1.1 | pg/L | 1 |
| PCB-102 | | 20 | U | 390 | | 5.6 | pg/L | 1 | | 20 | U | 400 | | 1.1 | pg/L | 1 |
| PCB-103 | | 9.8 | U | 200 | | 6.5 | pg/L | 1 | | 10 | U | 200 | | 1.3 | pg/L | 1 |
| PCB-104 | | 9.8 | U | 200 | | 0.45 | pg/L | 1 | | 10 | U | 200 | | 0.48 | pg/L | 1 |
| PCB-105 | | **72** | | 20 | | 5.7 | pg/L | 1 | | **15** | **J** | 20 | | 1.2 | pg/L | 1 |
| PCB-106 | | 20 | U | 200 | | 4.2 | pg/L | 1 | | 20 | U | 200 | | 0.85 | pg/L | 1 |
| PCB-107 | | **6.4** | **J** | 390 | | 4.9 | pg/L | 1 | | 20 | U | 400 | | 0.99 | pg/L | 1 |
| PCB-108 | | **110** | **J** | 1200 | | 5.3 | pg/L | 1 | | **14** | **J** | 1200 | | 1.1 | pg/L | 1 |
| PCB-109 | | **14** | **J** | 200 | | 5.2 | pg/L | 1 | | **2.9** | **J** | 200 | | 1.1 | pg/L | 1 |
| PCB-110 | | **270** | **J** | 390 | | 4.1 | pg/L | 1 | | **28** | **J** | 400 | | 0.83 | pg/L | 1 |
| PCB-111 | | 20 | U | 200 | | 4.7 | pg/L | 1 | | 20 | U | 200 | | 0.96 | pg/L | 1 |
| PCB-112 | | 9.8 | U M | 200 | | 3.8 | pg/L | 1 | | 10 | U | 200 | | 0.77 | pg/L | 1 |
| PCB-113 | | **290** | **J** | 590 | | 5.6 | pg/L | 1 | | **26** | **J** | 610 | | 1.1 | pg/L | 1 |
| PCB-114 | | 9.8 | U | 20 | | 6.2 | pg/L | 1 | | 10 | U | 20 | | 1.2 | pg/L | 1 |
| PCB-115 | | **270** | **J** | 390 | | 4.1 | pg/L | 1 | | **28** | **J** | 400 | | 0.83 | pg/L | 1 |
| PCB-116 | | **18** | **J** | 590 | | 5.5 | pg/L | 1 | | **2.4** | **J** | 610 | | 1.1 | pg/L | 1 |
| PCB-117 | | **18** | **J** | 590 | | 5.5 | pg/L | 1 | | **2.4** | **J** | 610 | | 1.1 | pg/L | 1 |
| PCB-118 | | **220** | | 20 | | 5.8 | pg/L | 1 | | **30** | | 20 | | 1.1 | pg/L | 1 |
| PCB-119 | | **110** | **J** | 1200 | | 5.3 | pg/L | 1 | | **14** | **J** | 1200 | | 1.1 | pg/L | 1 |
| PCB-120 | | 9.8 | U | 200 | | 4.1 | pg/L | 1 | | 10 | U | 200 | | 0.83 | pg/L | 1 |
| PCB-121 | | 9.8 | U | 200 | | 4.2 | pg/L | 1 | | 10 | U | 200 | | 0.86 | pg/L | 1 |
| PCB-122 | | 9.8 | U | 200 | | 6.2 | pg/L | 1 | | 10 | U | 200 | | 1.3 | pg/L | 1 |
| PCB-123 | | 9.8 | U | 20 | | 5.8 | pg/L | 1 | | 10 | U | 20 | | 1.2 | pg/L | 1 |
| PCB-124 | | **6.4** | **J** | 390 | | 4.9 | pg/L | 1 | | 20 | U | 400 | | 0.99 | pg/L | 1 |
| PCB-125 | | **110** | **J** | 1200 | | 5.3 | pg/L | 1 | | **14** | **J** | 1200 | | 1.1 | pg/L | 1 |
| PCB-126 | | 9.8 | U | 20 | | 5.5 | pg/L | 1 | | **1.4** | **J** | 20 | | 1.2 | pg/L | 1 |
| PCB-127 | | 20 | U | 200 | | 5.3 | pg/L | 1 | | 20 | U | 200 | | 1.1 | pg/L | 1 |
| PCB-128 | | **240** | **J** | 390 | | 7.4 | pg/L | 1 | | **22** | **J** | 400 | | 1.0 | pg/L | 1 |
| PCB-129 | | **2800** | | 590 | | 8.0 | pg/L | 1 | | **220** | **J** | 610 | | 1.1 | pg/L | 1 |
| PCB-130 | | **97** | **J** | 200 | | 11 | pg/L | 1 | | **9.3** | **J** | 200 | | 1.5 | pg/L | 1 |
| PCB-131 | | 20 | U | 200 | | 9.8 | pg/L | 1 | | 20 | U | 200 | | 1.4 | pg/L | 1 |
| PCB-132 | | **510** | | 200 | | 8.8 | pg/L | 1 | | **37** | **J** | 200 | | 1.2 | pg/L | 1 |
| PCB-133 | | **14** | **J** | 200 | | 8.3 | pg/L | 1 | | 10 | U | 200 | | 1.2 | pg/L | 1 |
| PCB-134 | | **48** | **J** | 390 | | 9.4 | pg/L | 1 | | 40 | U | 400 | | 1.3 | pg/L | 1 |
| PCB-135 | | **590** | | 390 | | 8.3 | pg/L | 1 | | **44** | **J** | 400 | | 1.2 | pg/L | 1 |
| PCB-136 | | **150** | **J** | 200 | | 6.7 | pg/L | 1 | | **10** | **J** | 200 | | 0.95 | pg/L | 1 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PCB-137 | | **48** | **J** | 200 | | 9.3 | pg/L | 1 | | **2.6** | **J** | 200 | | 1.3 | pg/L | 1 |
| PCB-138 | | **2800** | | 590 | | 8.0 | pg/L | 1 | | **220** | **J** | 610 | | 1.1 | pg/L | 1 |
| PCB-139 | | 20 | U | 390 | | 7.7 | pg/L | 1 | | 20 | U | 400 | | 1.1 | pg/L | 1 |
| PCB-140 | | 20 | U | 390 | | 7.7 | pg/L | 1 | | 20 | U | 400 | | 1.1 | pg/L | 1 |
| PCB-141 | | **600** | | 200 | | 8.3 | pg/L | 1 | | **49** | **J** | 200 | | 1.2 | pg/L | 1 |
| PCB-142 | | 9.8 | U | 200 | | 8.8 | pg/L | 1 | | 10 | U | 200 | | 1.2 | pg/L | 1 |
| PCB-143 | | **48** | **J** | 390 | | 9.4 | pg/L | 1 | | 40 | U | 400 | | 1.3 | pg/L | 1 |
| PCB-144 | | **84** | **J** | 200 | | 8.2 | pg/L | 1 | | **6.4** | **J** | 200 | | 1.2 | pg/L | 1 |
| PCB-145 | | 9.8 | U | 200 | | 5.8 | pg/L | 1 | | 10 | U | 200 | | 0.82 | pg/L | 1 |
| PCB-146 | | **270** | | 200 | | 7.7 | pg/L | 1 | | **27** | **J** | 200 | | 1.1 | pg/L | 1 |
| PCB-147 | | **1400** | | 390 | | 7.5 | pg/L | 1 | | **110** | **J** | 400 | | 1.1 | pg/L | 1 |
| PCB-148 | | 9.8 | U | 200 | | 8.4 | pg/L | 1 | | 10 | U | 200 | | 1.2 | pg/L | 1 |
| PCB-149 | | **1400** | | 390 | | 7.5 | pg/L | 1 | | **110** | **J** | 400 | | 1.1 | pg/L | 1 |
| PCB-150 | | 20 | U | 200 | | 5.9 | pg/L | 1 | | 20 | U | 200 | | 0.83 | pg/L | 1 |
| PCB-151 | | **590** | | 390 | | 8.3 | pg/L | 1 | | **44** | **J** | 400 | | 1.2 | pg/L | 1 |
| PCB-152 | | 9.8 | U | 200 | | 5.6 | pg/L | 1 | | 10 | U | 200 | | 0.8 | pg/L | 1 |
| PCB-153 | | **2200** | | 390 | | 6.7 | pg/L | 1 | | **190** | **J** | 400 | | 0.94 | pg/L | 1 |
| PCB-154 | | 9.8 | U | 200 | | 7.4 | pg/L | 1 | | 10 | U | 200 | | 1.1 | pg/L | 1 |
| PCB-155 | | 9.8 | U | 200 | | 6.5 | pg/L | 1 | | 10 | U | 200 | | 0.87 | pg/L | 1 |
| PCB-156 | | **210** | | 39 | | 6.2 | pg/L | 1 | | **24** | **J** | 40 | | 1.1 | pg/L | 1 |
| PCB-157 | | **210** | | 39 | | 6.2 | pg/L | 1 | | **24** | **J** | 40 | | 1.1 | pg/L | 1 |
| PCB-158 | | **250** | | 200 | | 6.4 | pg/L | 1 | | **20** | **J** | 200 | | 0.91 | pg/L | 1 |
| PCB-159 | | **73** | **J** | 200 | | 3.9 | pg/L | 1 | | **5.4** | **J** | 200 | | 0.68 | pg/L | 1 |
| PCB-160 | | 20 | U | 200 | | 7.9 | pg/L | 1 | | 20 | U | 200 | | 1.1 | pg/L | 1 |
| PCB-161 | | 9.8 | U | 200 | | 5.8 | pg/L | 1 | | 10 | U | 200 | | 0.82 | pg/L | 1 |
| PCB-162 | | **8.7** | **J** | 200 | | 4.3 | pg/L | 1 | | **0.89** | **J** | 200 | | 0.76 | pg/L | 1 |
| PCB-163 | | **2800** | | 590 | | 8.0 | pg/L | 1 | | **220** | **J** | 610 | | 1.1 | pg/L | 1 |
| PCB-164 | | **170** | **J** | 200 | | 5.9 | pg/L | 1 | | **14** | **J** | 200 | | 0.84 | pg/L | 1 |
| PCB-165 | | 9.8 | U | 200 | | 7.2 | pg/L | 1 | | 10 | U | 200 | | 1.0 | pg/L | 1 |
| PCB-166 | | **240** | **J** | 390 | | 7.4 | pg/L | 1 | | **22** | **J** | 400 | | 1.0 | pg/L | 1 |
| PCB-167 | | **110** | | 20 | | 4.6 | pg/L | 1 | | **11** | **J** | 20 | | 0.79 | pg/L | 1 |
| PCB-168 | | **2200** | | 390 | | 6.7 | pg/L | 1 | | **190** | **J** | 400 | | 0.94 | pg/L | 1 |
| PCB-169 | | 9.8 | U | 20 | | 11 | pg/L | 1 | | **2.5** | **J** | 20 | | 0.87 | pg/L | 1 |
| PCB-170 | | **2100** | | 200 | | 20 | pg/L | 1 | | **220** | | 200 | | 2.5 | pg/L | 1 |
| PCB-171 | | **450** | | 390 | | 16 | pg/L | 1 | | **42** | **J** | 400 | | 2.0 | | |
| PCB-172 | | **300** | | 200 | | 17 | pg/L | 1 | | **30** | **J** | 200 | | 2.2 | pg/L | 1 |
| PCB-173 | | **450** | | 390 | | 16 | pg/L | 1 | | **42** | **J** | 400 | | 2.0 | pg/L | 1 |
| PCB-174 | | **1700** | | 200 | | 15 | pg/L | 1 | | **150** | **J** | 200 | | 1.9 | pg/L | 1 |
| PCB-175 | | **68** | **J** | 200 | | 0.83 | pg/L | 1 | | **6.5** | **J** | 200 | | 0.67 | pg/L | 1 |
| PCB-176 | | **150** | **J** | 200 | | 0.64 | pg/L | 1 | | **11** | **J** | 200 | | 0.51 | pg/L | 1 |
| PCB-177 | | **870** | | 200 | | 15 | pg/L | 1 | | **83** | **J** | 200 | | 1.9 | pg/L | 1 |
| PCB-178 | | **300** | | 200 | | 0.85 | pg/L | 1 | | **30** | **J** | 200 | | 0.69 | pg/L | 1 |
| PCB-179 | | **360** | | 200 | | 0.51 | pg/L | 1 | | **32** | **J** | 200 | | 0.41 | pg/L | 1 |
| PCB-180 | | **4500** | | 390 | | 14 | pg/L | 1 | | **410** | | 400 | | 1.8 | pg/L | 1 |
| PCB-181 | | 9.8 | U | 200 | | 15 | pg/L | 1 | | 10 | U | 200 | | 1.8 | pg/L | 1 |
| PCB-182 | | 9.8 | U | 200 | | 0.68 | pg/L | 2 | | 10 | U | 200 | | 0.55 | | |
| PCB-183 | | **930** | | 200 | | 15 | pg/L | 1 | | **74** | **J** | 200 | | 1.9 | pg/L | 1 |
| PCB-184 | | 20 | U | 200 | | 0.58 | pg/L | 1 | | 20 | U | 200 | | 0.47 | pg/L | 1 |
| PCB-185 | | **170** | **J** | 200 | | 15 | pg/L | 1 | | **22** | **J** | 200 | | 1.9 | pg/L | 1 |
| PCB-186 | | 9.8 | U | 200 | | 0.51 | pg/L | 1 | | 10 | U | 200 | | 0.41 | pg/L | 1 |
| PCB-187 | | **1900** | | 200 | | 0.69 | pg/L | 1 | | **170** | **J** | 200 | | 0.56 | pg/L | 1 |
| PCB-188 | | 9.8 | U | 200 | | 0.84 | pg/L | 1 | | 10 | U | 200 | | 0.57 | pg/L | 1 |
| PCB-189 | | **81** | | 20 | | 0.54 | pg/L | 1 | | **10** | **J** | 20 | | 0.47 | pg/L | 1 |
| PCB-190 | | **440** | | 200 | | 14 | pg/L | 1 | | **49** | **J** | 200 | | 1.7 | pg/L | 1 |
| PCB-191 | | **80** | **J** | 200 | | 14 | pg/L | 1 | | **7.3** | **J** | 200 | | 1.7 | pg/L | 1 |
| PCB-192 | | 20 | U | 200 | | 12 | pg/L | 1 | | 20 | U | 200 | | 1.5 | pg/L | 1 |
| PCB-193 | | **4500** | | 390 | | 14 | pg/L | 1 | | **410** | | 400 | | 1.8 | pg/L | 1 |
| PCB-194 | | **1300** | | 200 | | 0.99 | pg/L | 1 | | **150** | **J** | 200 | | 0.53 | pg/L | 1 |
| PCB-195 | | **500** | | 200 | | 1.0 | pg/L | 1 | | **55** | **J** | 200 | | 0.54 | pg/L | 1 |
| PCB-196 | | **620** | | 200 | | 3.0 | pg/L | 2 | | **65** | **J** | 200 | | 0.61 | | |
| PCB-197 | | **31** | **J** | 200 | | 1.9 | pg/L | 1 | | **3.9** | **J** | 200 | | 0.40 | pg/L | 1 |
| PCB-198 | | **1100** | | 390 | | 2.7 | pg/L | 1 | | **120** | **J** | 400 | | 0.55 | pg/L | 1 |
| PCB-199 | | **1100** | | 390 | | 2.7 | pg/L | 1 | | **120** | **J** | 400 | | 0.55 | pg/L | 1 |
| PCB-200 | | **130** | **J** | 200 | | 2.1 | pg/L | 1 | | **13** | **J** | 200 | | 0.43 | pg/L | 1 |
| PCB-201 | | **110** | **J** | 200 | | 2.3 | pg/L | 1 | | **12** | **J** | 200 | | 0.47 | pg/L | 1 |
| PCB-202 | | **150** | **J** | 200 | | 2.6 | pg/L | 1 | | **15** | **J** | 200 | | 0.50 | pg/L | 1 |
| PCB-203 | | **640** | | 200 | | 2.4 | pg/L | 1 | | **68** | **J** | 200 | | 0.49 | pg/L | 1 |
| PCB-204 | | 20 | U | 200 | | 2.0 | pg/L | 1 | | 20 | U | 200 | | 0.40 | pg/L | 1 |
| PCB-205 | | **79** | **J** | 200 | | 0.8 | pg/L | 1 | | **9.5** | **J** | 200 | | 0.45 | pg/L | 1 |
| PCB-206 | | **290** | | 200 | | 1.8 | pg/L | 1 | | **42** | **J** | 200 | | 2.1 | pg/L | 1 |
| PCB-207 | | **36** | **J** | 200 | | 1.1 | pg/L | 1 | | **5.5** | **J** | 200 | | 1.2 | pg/L | 1 |
| PCB-208 | | **48** | **J** | 200 | | 1.2 | pg/L | 1 | | **8.4** | **J** | 200 | | 1.3 | pg/L | 1 |
| PCB-209 | | **13** | **J** | 200 | | 0.38 | pg/L | 1 | | **6.2** | **J** | 200 | | 0.45 | pg/L | 1 |